

ONKYO SERVICE MANUAL

QUARTZ SYNTHESIZED TUNER AMPLIFIER MODEL TX-36



UD, UDN, BUD, BUDN	120V AC, 60Hz
UG, UGV, BUG, BUGV	220V AC, 50Hz
UW	120 or 220V AC, 50/60Hz
UQB	240V AC, 50Hz

Silver and black models

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK \triangle ON THE SCHEMATIC DIAGRAM AND IN THE PARTS LIST ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE THESE COMPONENTS WITH ONKYO PARTS WHOSE PARTS NUMBERS APPEAR AS SHOWN IN THIS MANUAL.

MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

SPECIFICATIONS

AMPLIFIER SECTION

Power Output:	50 watts per channel, min. RMS, at 8 ohms, both channels driven, from 20 Hz to 20 kHz, with no more than 0.04% THD.
Music Power Output:	2 x 110 watts at 4 ohms, 1 kHz (DIN) 2 x 75 watts at 8 ohms, 1 kHz (DIN)
Continuous Power Output:	2 x 75 watts at 4 ohms, 1 kHz (DIN) 2 x 50 watts at 8 ohms, 1 kHz (DIN)
Total Harmonic Distortion:	0.04% at rated power 0.04% at 1 watt output
IM Distortion:	0.04% at rated power 0.04% at 1 watt output
Damping Factor:	35 at 8 ohms
Frequency Response:	20 – 30,000 Hz ± 1 dB
RIAA Deviation:	20 – 20,000 Hz ± 0.8 dB
Sensitivity and Impedance:	Phono: 2.5 mV/50 kohms Tape Play: 150 mV/50 kohms Tape Rec: 150 mV/3.5 kohms (phono)
Phono Overload:	180 mV RMS at 1 kHz, 0.08% THD
Signal-to-Noise Ratio:	Phono: 85 dB (at 10 mV input, A weighted) 76 dB (IHF A-202) Tape: 95 dB (A weighted) 80 dB (IHF A-202)
Tone Controls:	Bass: ± 8 dB at 100 Hz Treble: ± 8 dB at 10 kHz
Loudness (–30 dB):	+7 dB at 70 Hz, +5 dB at 10 kHz
Subsonic:	–6 dB at 15 Hz

ONKYO
AUDIO COMPONENTS

TUNER SECTION**FM:**

Tuning Range:

Usable sensitivity:

50 dB Quieting Sensitivity:

Capture Ratio:

Image Rejection Ratio:

IF Rejection Ratio:

Signal-to Noise Ratio:

Selectivity:

AM Suppression Ratio:

Harmonic Distortion:

Frequency Response:

Stereo Separation:

Tuning Level (Hi/Low):

Stereo Threshold:

AM:

Tuning Range:

Usable Sensitivity:

Image Rejection Ratio:

IF Rejection Ratio:

Signal-to-Noise Ratio:

Harmonic Distortion:

GENERAL:

Semiconductors:

Dimensions (WxHxD):

Weight:

120V model

87.5 – 108.0 MHz (100 kHz steps)

Mono: 10.8 dBf, 1.9 μ VStereo: 17.2 dBf, 4.0 μ VMono: 17.2 dBf, 4.0 μ VStereo: 37.2 dBf, 40 μ V

1.5 dB

40 dB

90 dB

Mono: 72 dB

Stereo: 67 dB

55 dB

50 dB

Mono: 0.15%

Stereo: 0.25%

30 – 15,000 Hz \pm 1.5 dB

40 dB at 1 kHz

30 dB at 100 – 10,000 Hz

23.2 dBf, 8 μ V/17.2 dBf, 4 μ V23.2 dBf, 8 μ V/17.2 dBf, 4 μ V

520 – 1,710 kHz (10 kHz steps)

30 μ V

40 dB

30 dB

40 dB

0.8%

EETs: 6 TR: 34 ICs: 11

Diodes: 82

418 x 112 x 340 mm

(16 1/2" x 4 1/2" x 13 3/8")

8.1 kg, 17.8 lbs.

220/240V model

87.5 – 108.0 MHz (50 kHz steps)

Mono: 11.2 dBf, 1.0 μ VStereo: 18.0 dBf, 2.2 μ VMono: 18.0 dBf, 2.2 μ VStereo: 37.2 dBf, 20 μ V

1.5dB

85 dB

90 dB

Mono: 72 dB

Stereo: 67 dB

50 dB DIN (\pm 300 kHz 40 kHz dev.)

50 dB

Mono: 0.15%

Stereo: 0.25%

30 – 15,000 Hz \pm 1.5 dB

40 dB at 1 kHz

30 dB at 100 – 10,000 Hz

23.2 dBf, 4 μ V/17.2 dBf, 2 μ V23.2 dBf, 4 μ V/17.2 dBf, 2 μ V

522 – 1,611 kHz (9 kHz steps)

30 μ V

40 dB

30 dB

40 dB

0.8%

EETs: 6 TR: 38 ICs: 11

Diodes: 85

418 x 112 x 340 mm

(16 1/2" x 4 1/2" x 13 3/8")

8.1 kg, 17.8 lbs.

SERVICE PROCEDURES

1. Replacing the fuses

For continued protection against fire hazard, replace only with same type and same rating fuse.

D (120V) model

Circuit no.	Parts no.	Description
F501, F601	252059	4A (SS-2), Speaker
F901	252049	4A (ST-6), Primary

G (220V) and Q (240V) models

Circuit no.	Parts no.	Description
F501, F601	252077	4A-SE-EAK, Speaker
F902	252074	2A-SE-EAK, Primary
F903, F904	252078	5A-SE-EAK, Secondary
F905, F906	252070	1A-SE-EAK, Secondary
F907	252088	250mA-SE-EAK, Secondary

W(120 or 220V) model

Circuit no.	Parts no.	Description
F501, F601	252059	4A (SS-2), Speaker
F901	252049	4A (ST-6), Primary
F902	252074	2A-SE-EAK, Primary

2. Replacing the lamps

This unit uses the lamps listed below.

Circuit no.	Parts no.	Description
PL901, PL902	210162	PL 6.3V, 250mA, Dial plate illumination

Remove the top cover.

Remove the front panel.

Remove the holder.

(See fig. 2)

3. Insulation resistance measurement (Only U.S.A. model)

Connect the insulating-resistance tester between the plug of power supply cable and terminal GND.

Specifications: $3.3 \pm 0.3M$ ohm

4. Disassembling procedures

Selector switch pc board

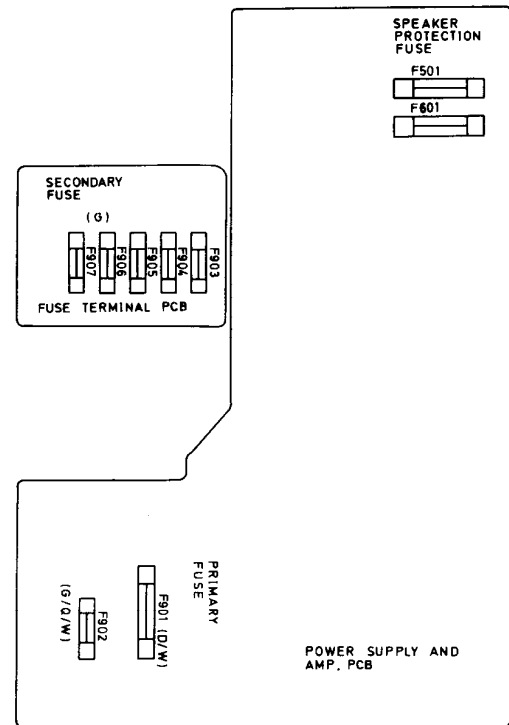
Remove the top cover.

Remove the all screws on the back panel.

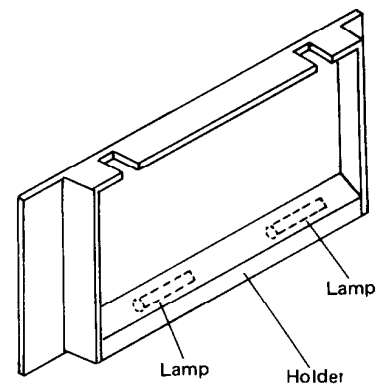
Remove a screw holding the radiator and bracket, pcb.

5. Change of AM scan step

W models are equipped with a switch to change the AM scan step frequency from 9kHz to 10kHz. The switch is located on the back panel. This switch is set to 9kHz at the factory; change to 10kHz if gives better results in your locality.



(fig. 1)



(fig. 2)

6. Change of De-emphasis

W models are equipped with a $50\mu\text{sec}$ - $75\mu\text{sec}$ selector switch. This switch is located on the back panel. This switch is set to $50\mu\text{sec}$ at the factory, but may have to be reset to $75\mu\text{sec}$ depending on the area where the unit is used.

Europe: $50\mu\text{sec}$

U.S.A.: $75\mu\text{sec}$

7. Change of voltage

W models are equipped with a voltage selector to conform with local power supplies. This switch is located on the back panel. Be sure to set this switch to match the voltage of the power supply in your area before turning the power switch on.

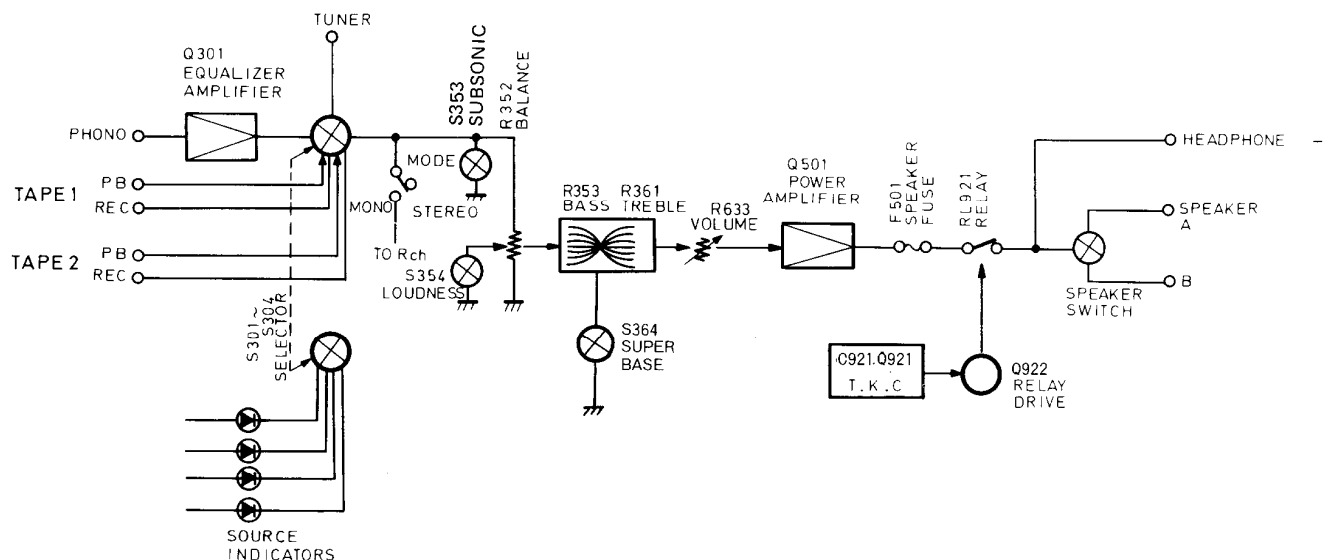
This switch is set to 220V at the factory. Voltage is changed by sliding the groove in the switch with the screwdriver to the right or left. Confirm that the switch has been moved all the way to the right or left before turning the power switch on.

8. Memory Preservation

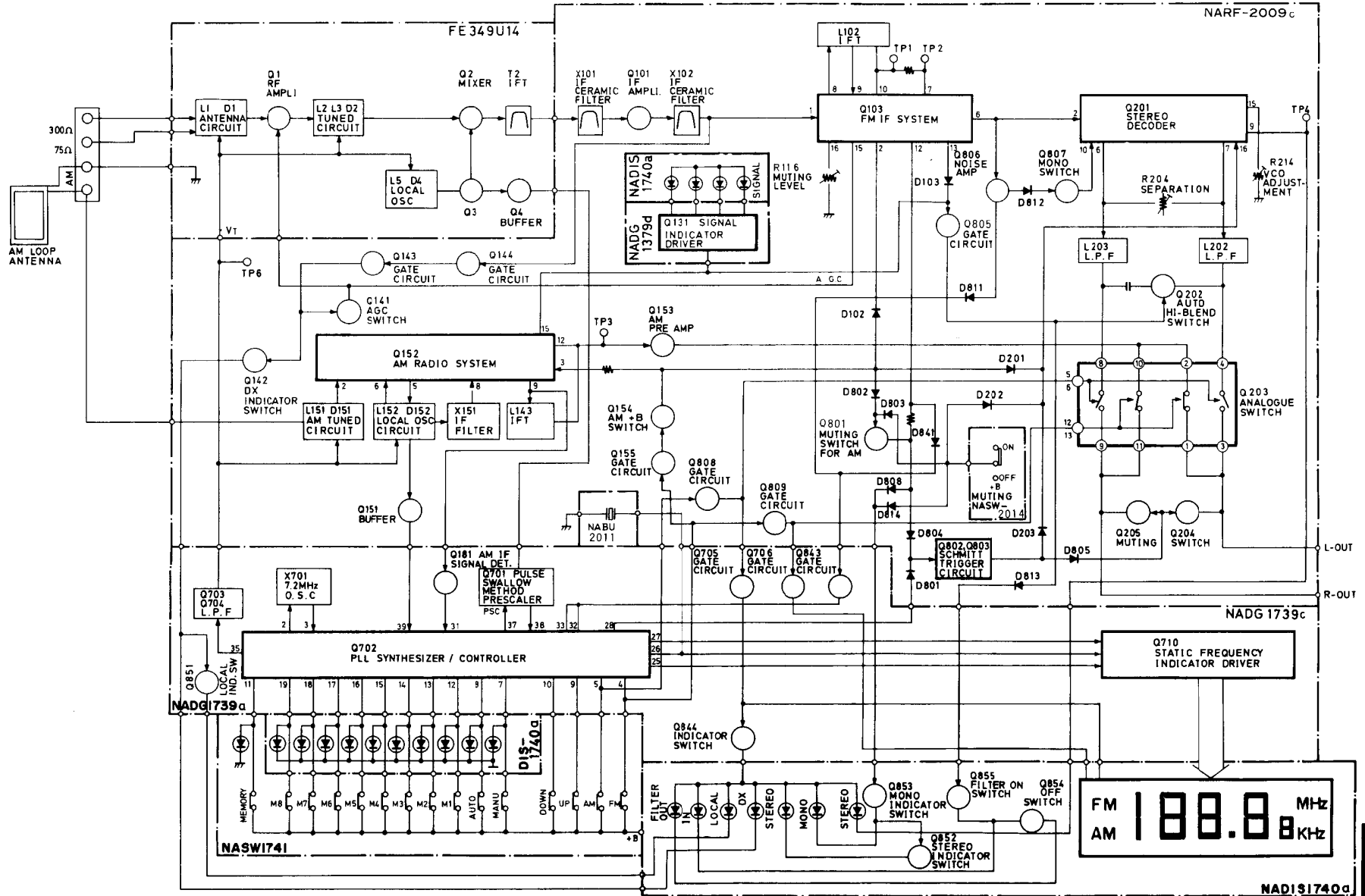
This unit does not require memory preservation batteries. A built-in memory power back-up system preserves contents of the memory during power failures and even when the unit is unplugged. The unit must be plugged in and the power switch turned on and off once in order to charge the back-up system. Note that since this is not a permanent memory, the power switch must be turned on and off a few times each month to keep the back-up system operable. The period of time during which memory contents are preserved after power has last been turned off varies depending on climate and the location and placement of the unit. On the average, memory contents are protected over a period of 3 to 4 weeks (a minimum of 2 weeks) after the last time power has been turned off. This period is shorter when the unit is exposed to very high humidity or used in an area with an extremely humid climate.

BLOCK DIAGRAM

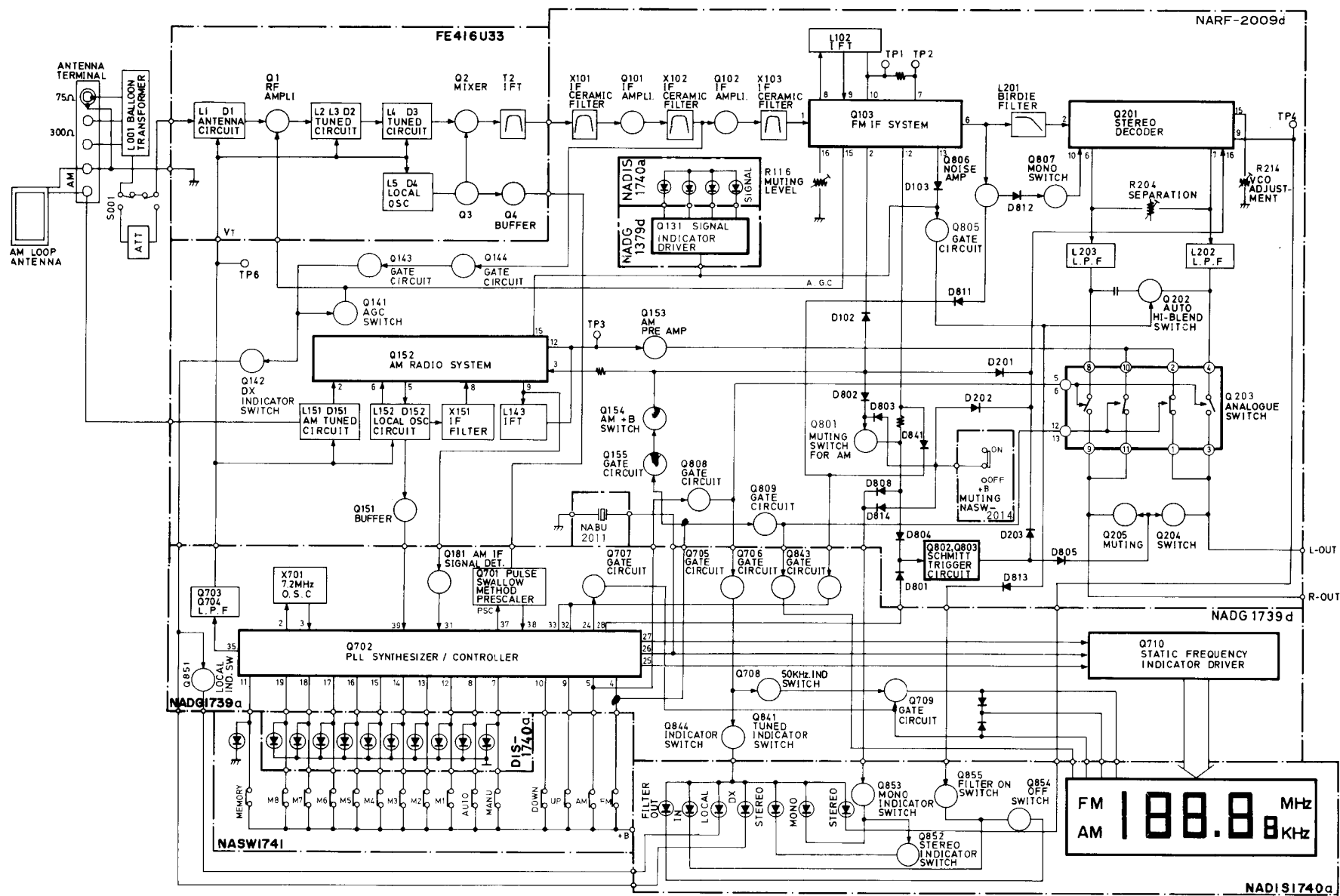
Amplifier section



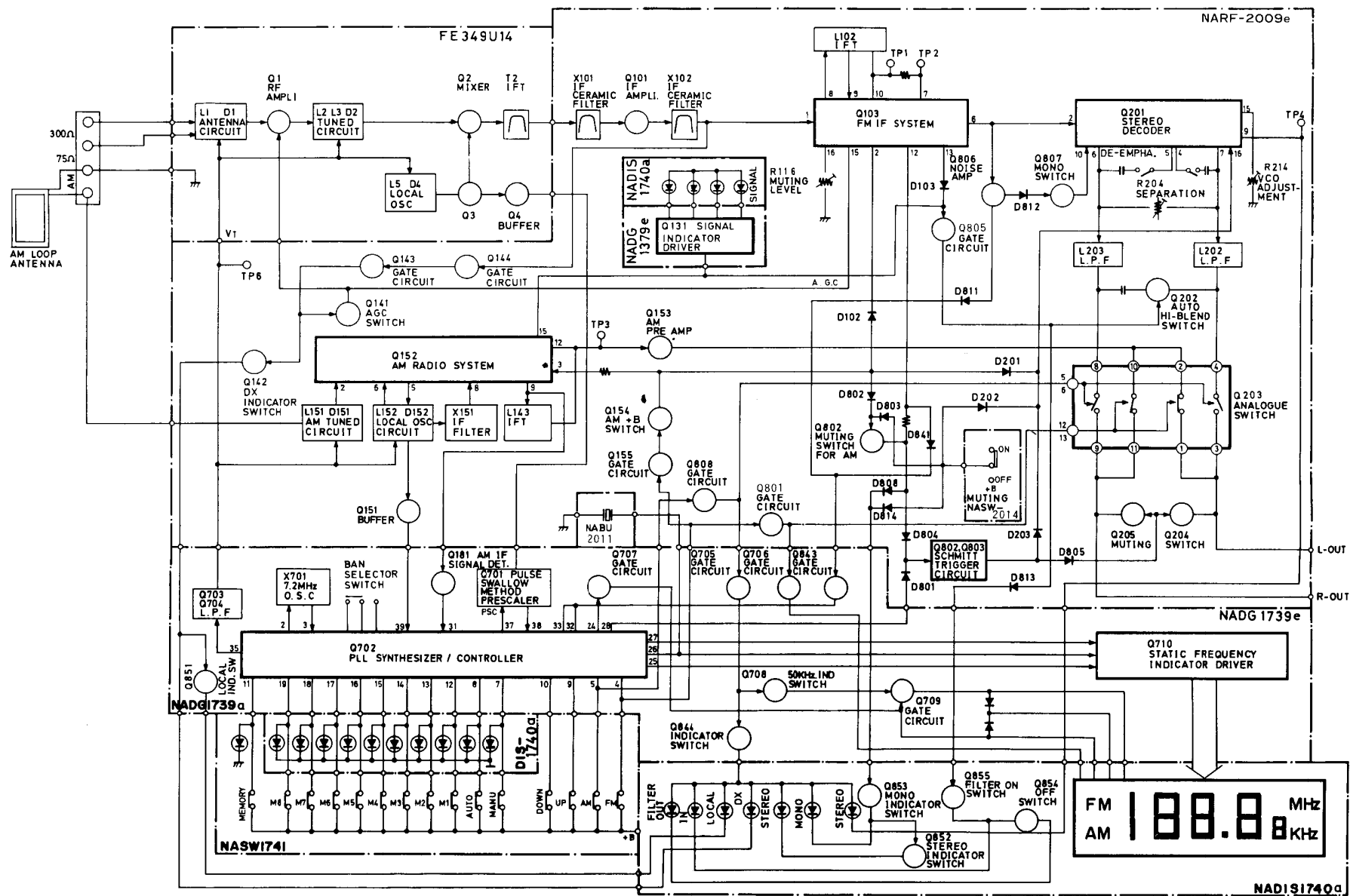
—D model—

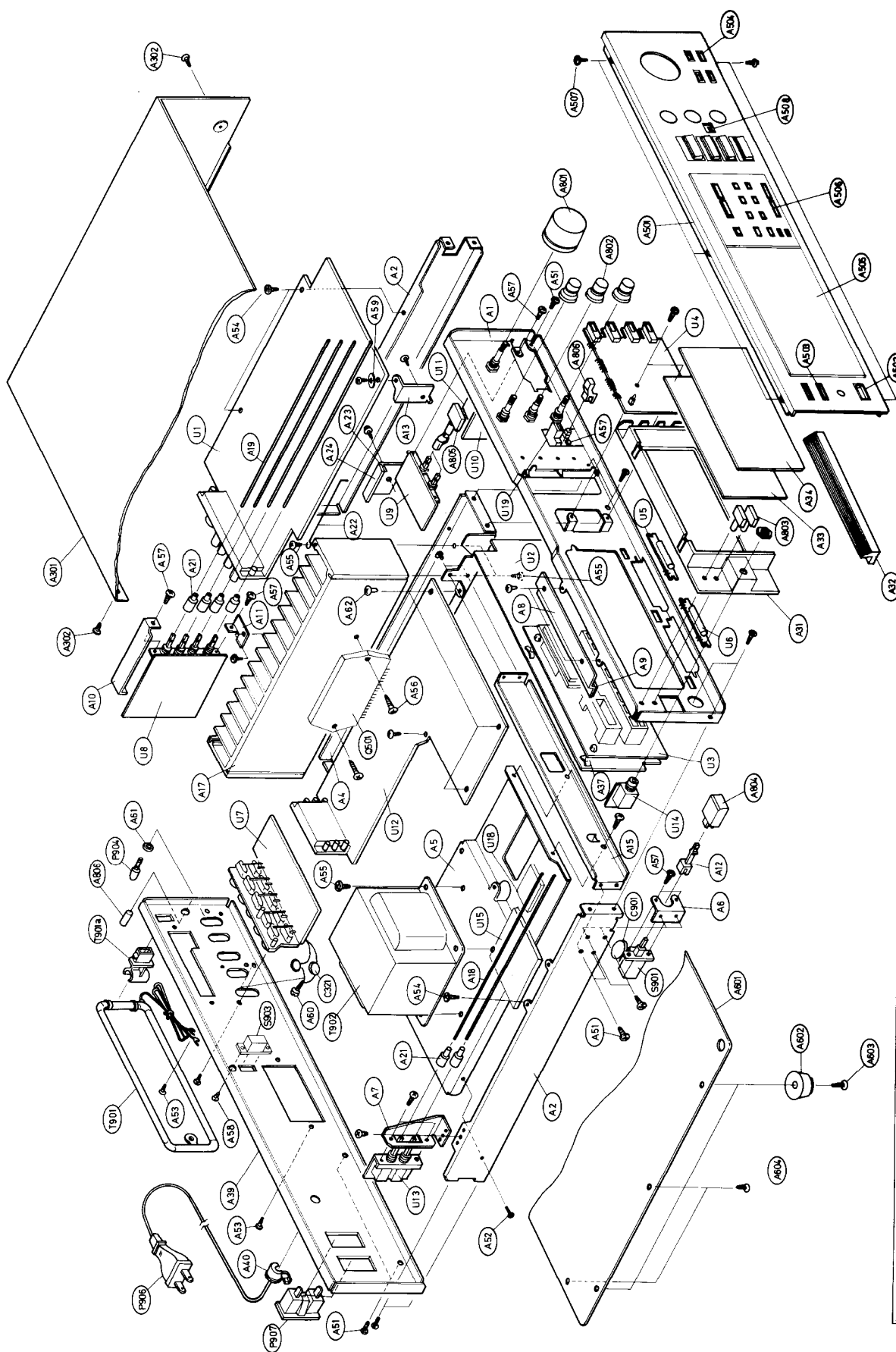


—G model—




—W model—





Notes: (D): Only 120V model
 (S): Only silver model
 (G): Only 220V model
 (B): Only black model
 (W): Only 120/220V model

NOTE: THE COMPONENTS IDENTIFIED BY MARK  ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PARTS NUMBER SPECIFIED.

DAIGAE
TX-36 UD

日付：85/04/17 ページ： 1

P/N	Location	SUB		Original	Serial Range
		部品名	代替部品	正規部品	適用台数
590721	Q805,806,951,953	TRANSISTOR	2SC1815BL	2SC1815GR	2538-4137
590721	Q704	FET	2SK68AM	2SK68M	2538-4137
590627	Q805,806,951,953	TRANSISTOR	2SC1815BL	2SC1815GR	1738-2537
590809	Q704	FET	2SK68AM	2SK68M	4138-5637
590720	Q703	TRANSISTOR	2SC1815BL	2SC1815GR	2538-4137
590720	Q921	TRANSISTOR	2SC1815BL	2SC1815GR	2538-4137
590924	Q103	IC	MPC1267C	MPC1167C2	7138-8137
591017	Q101	TRANSISTOR	2SC1923R	2SC19230	8638-10637
600118	Q704	FET	2SK68AM	2SK68M	13338-14337

CHANGE OF PARTS
MODEL TX-36

10-31-8

ONKYO CORPORATION
SERVICE DIVISION

TYPE	CIRCUIT NO.	DESCRIPTION	AFTER CHANGE SPECIFICATIONS	PART NO	BEFORE CHANGE SPECIFICATIONS	PART NO.	APPLI- CATION	CHANGE DESCRIPTION
NARF-2009c/e	Q103 R116 R815 R149	IC Semi-fixed Carbon Carbon	μ PC1167C2 N08H150KBC R25J 330K R25J 4.7K	222608 5215046	μ PC1267C N08H20KBC R25J 75K R25J 1K	222803 5215003	5638-	The supply of part is insufficiency.
NAAF-2031c	C505, C605	Elect.	100 μ F,10V	3500080	100 μ F,10V	352731019	5638-	To flame-proof type (UL)
	PL901 PL902	Lamp pcb ass'y Lamp pcb ass'y Pilot lamp Pilot lamp Insulator plate	Abolition Abolition PL6.3V0.25A PL6.3V0.25A (Pc board)	210162 210162 28175110	NAPL-1743 NAPL-1744 Add Add Add		(UL)	Change of material of pc board
NARF-2009c	C801 C802	Elect. Elect.	1 μ F,50V 0,22 μ F,50V	352780109 352782299	0.22 μ F,50V Add	352782299	1738-	Improvement of muting hysteresis.
	A805	Knob ass'y Knob ass'y	(Silver) (Black)	28321583A 28321584A		28321583 28321584		
NARF-2009c	R124	Carbon	R25J 10K (Parallel C113)		Add		1738-	To be stabilize the signal indicator.

PARTS LIST

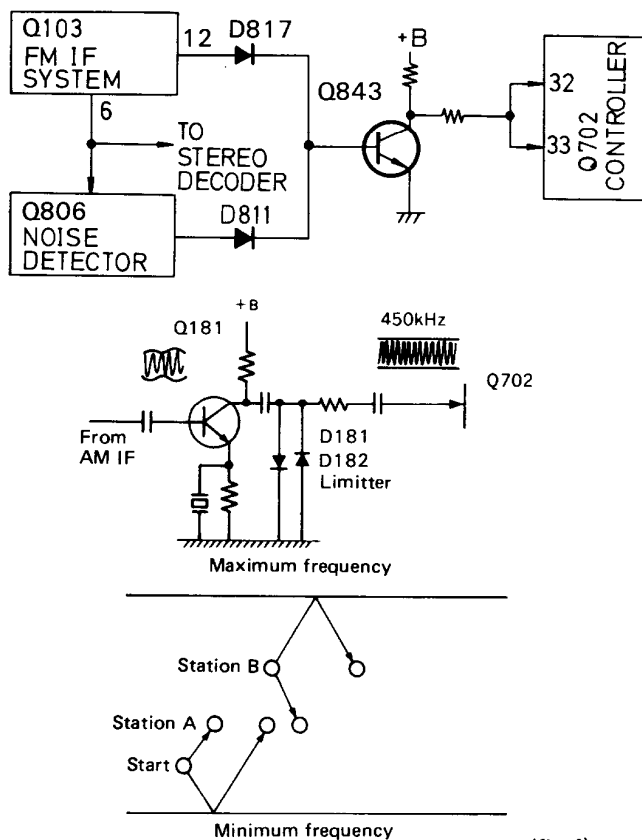
REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION
A1	27110202-1A	Front bracket	A505	28191202	Clear plate	△ T902	230792	NPT-838G,Power transformer(G)
A2	27115145A	Side bracket	A506	28321584	Knob ass'y	△	230793	NPT-838DG,Power transformer (W)
A4	27130339B	Bracket,radiator	A508	27267333-1	Guide S			
A5	27130340A	Bracket,power transformer	A507	834430068	3TTS+6B(BC),Tapping screw	U1	18148509C	NARF-2009C, FM/AM tuner pc board ass'y(D)
A6	27140805	Bracket,power	A509	29110050	Aluminium tape on the front panel			
A7	27140806	Bracket,speaker						
A8	27140807	Bracket,holder	A601	27170160	Bottom board		18194509D	NARF-2009d,FM/AM tuner pc board ass'y(G)
A9	28140260	1.5×10×100mm,Cushion	A602	27175009A	Leg		18190509E	NARF-2009e,FM/AM tuner pc board ass'y(G)
A10	27140808	Bracket,selector	A603	834430128	3TTS+12B(BC),Tapping screw	U2	18048539C	NADG-1739c,Digital circuit pc board ass'y(D)
A11	27140809A	Bracket S	A604	831430088	3TTW+8B(BC),Tapping screw			
A12	27260062	Shaft,switch	A801	83320543-1	Knob,volume (S)		18054539D	NADG-1739d,Digital circuit pc board ass'y(G)
A13	27140810A	Bracket,PCB	A802	28320892	Knob,volume (B)	U3	18048540A	NADIS-1740a,Fluorescent indicator pc board ass'y
A15	27130341	Bracket F		28321205	Knob,balance (S)			
A17	27160133	Radiator	A803	28321206	Knob,balance (B)	U4	18008541	NASW-1741,Tuner switch circuit pc board ass'y
A18	27260123	Shaft		28321207	Knob,push (S)	U5	18008543	NAPL-1743,Dial plate illumination lamp pc board ass'y
A19	27260124	Shaft	A804	28321208	Knob,push (B)	U6	18008544	NAPL-1744,Dial plate illumination lamp pc board ass'y
A21	28320135	Connector		28320852	Knob,power (S)	U7	18148512	NAEQ-2012,Equalizer amplifier pc board ass'y(D/ W)
A22	27300656	Spring	A805	28321160	Knob,power (B)		18154512A	NAEQ-2012a,Equalizer amplifier pc board ass'y(G)
A23	27140928	Bracket PCS		28321215	Knob,push (S)	U8	18148513	NASW-2013,Selector switch pc board ass'y
A24	28175100	Insulating plate	A806	28321216	Knob,push (B)	U9	18188514A	NASW-2014a, Mode/ loudness switch pc board ass'y
A31	27190220	Holder,pcb	A807	28321522	Knob,push (S)	U10	18148515	NATC-2015, Tone control circuit pc board ass'y
A32	27190221	Holder,lamp		28321523	Knob,push (B)	U11	18148516	NAVR-2016,Volume control pc board ass'y
A33	28133103	Back plate		28320461	Knob,push (G)	U12	18188531C	NAAF-2031c,Power supply and power amplifier pc board ass'y(D)
A34	28130217	Dial plate	△ C901	3500065A	0.01μF,AC400V/125V,Capacitor IS		18194531D	NAAF-2031d,Power supply and power amplifier pc board ass'y(G)
A37	27190011	Holder	△ C901a	27300601	Cover for C901	U13	18190531E	NAAF-2031e,Power supply and power amplifier pc board ass'y(W)
A39	27120595	Back panel (D)	C321,C322	330924730	0.047μF,50V,Ceramic capacitor (D)	U14	18188532A	NASW-2032a,Speaker selector switch pc board ass'y
△ A40	27120597	Back panel (G)				U15	18148533	NAHP-2033,Headphone terminal pc board ass'y
A51	270280	SR-4K-4,Strainrelief	C990	335622230	0.022μF,50V, Ceramic capacitor	U16	18154534	NAFU-2034,Fuse terminal pc board ass'y
A52	834430068	3TTS+6B(BC),Tapping screw	△ F501,F601	252059	4A(SS-2),Speaker protection fuse(D/W)	U17	18154510	NASW-2010,De-emphasis switch pc board ass'y(W)
A53	834430068	3TTS+6B(BC),Tapping screw	△	252077	4A-SE-EAK,K,Speaker protection fuse(G)	U18	18010542	NASW-1742,Band selector switch pc board ass'y(W)
A54	834430108	3TTS+10B(BC),Tapping screw	△ F901	252049	4A(ST-6),Primary fuse(D/W)	U19	18188511	NABU-2011,Buzzer pc board ass'y
A55	831130088	3TTW+8B,Tapping screw	△ F902	252074	2A-SE-EAK,Primary fuse(G/W)		18148517	NATS-2017,Super base switch pc board ass'y
A56	838440089	4TTB+8C(BC),Tapping screw	△ F903,F904	252078	5A-SE-EAK,K,Secondary fuse(G)			
A57	834430168	3TTS+16B(BC),Tapping screw	△ F905,F906	252070	1A-SE-EAK,Secondary fuse (G)			
A61	82143006	3P+6FN(BC),Pan head screw	△ F907	252088	250mA-SE-EAK,Secondary fuse (G)			
A62	87613010	W3×10F,Washer	P904	25060044	Terminal,ground			
A63	831430088	3TTW+8B(BC),Tapping screw	△ P906	253112	AS-UC-4#18,Power supply cable(D)			
A66	82142604	2.6P+4F(BC),Pan head screw	△	253083-1	AS-CEE,Power supply cord (G/W)			
A301	28184201	Top cover(S)	△ P907	25050046	NSCT-2PI5,AC outlet(D)			
A302	28184202	Top cover (B)	P908	223004-1	Terminal			
A303	834430068	3TTS+6B(BC),Tapping screw	Q501,Q601	222036	STK-4893,Power amplifier IC			
A501	18188121	Front panel ass'y (S)	△ S901	25035398	NPS-111-L362P,Power switch			
A502	27267215	Guide,power	S902	25065123	NPS-1258P,Voltage selector switch			
A503	27267280	Guide,speaker	S903	250142	NSS-2225,Buzzer switch (W)			
A504	27267282	Guide,push	T901	232085	AM loop antenna			
A505	28198607	Clear plate	T901a	27190105	Holder,antenna			
A506	28321583	Knob ass'y	△ T902	230791	NPT-838D,Power transformer(D)			
A508	27267333-1	Guide S						
A509	18268121	Front panel ass'y (B)						
A510	27267215	Guide,power,						
A511	27267280	Guide,speaker						
A512	27267282	Guide,push						
A513	28198607	Clear plate						
A514	28321583	Knob ass'y						
A515	27267333-1	Guide S						
A516	18268121	Front panel ass'y (B)						
A517	27267215	Guide,power,						
A518	27267280	Guide,speaker						
A519	27267282	Guide,push						

CIRCUIT DESCRIPTIONS

1. Synthesizer and controller operation

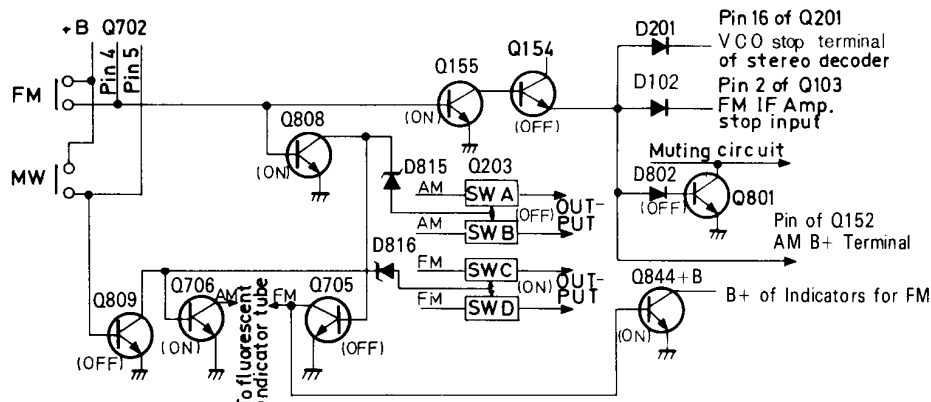
Pin No.	Symbol	Terminal	Description
1	GND	Ground	
2	XT	X'tal	Connected to the 7.2MHz crystal oscillator for the reference frequency.
3	XT		
4	FM	FM band specification input	Mutual reset type, performs switching of each band, FM/MW/LW.
5	MW	MW band specification input	
6	LW	LW band specification input	
7	MANUAL	Manual tuning mode specification input	Mutual reset type, performs auto search and manual operation mode switching during UP/DOWN tuning.
8	AUTO	Auto search tuning mode specification input	
9	UP	UP tuning key input	Connect the push key and perform UP/DOWN tuning.
10	DOWN	DOWN tuning key input	
11	STO	Memory store command input	The preset memory is set to the write mode when the key is pressed.
12-19	M1-M8	Preset memory channel specification input	Controls the write and read out of the internal 16-station preset memory along with the MC1 and MC2 input.
20	MC-1	Memory control input	Set the 16-station preset memory to the 8 FM/8 AM station mode or the FM/MW/LW 3-band 16-station random mode. The 8 FM/8 AM mode is used in this unit.
21	MC-2		
22	OSC2	AM oscillator terminal	CR connection terminal for the oscillator that determines the scan speed during the AM search mode.
23	OSC1	FM oscillator terminal	CR connection terminal for the oscillator that determines the scan speed during the FM search mode.
24	O/5	FM 50 kHz output	Output that represents the 50kHz FM band tuning step for European models. Goes to the high level for the 50 kHz setting.
25	CK2	Tuned frequency data output	Outputs the serial data and timing clock to the tuned frequency display driver.
26	CK1		
27	DATA		
28	MUTE	Muting signal output	Goes to the high level during muting output.
29	E2	Regin specification input	See table 1.
30	E1		
31	STOP 3	AM IF signal input	During AM reception, this counts the IF signal and stops auto search.
32	STOP 2	Auto search stop signal input	When the stop 1 input (pin 33) is at the high level and this terminal goes to the high level, auto search is stopped.
33	STOP 1	Scan speed slow input	When the high level is input at this terminal, the auto search speed is cut in half.

3. Auto-search tuning circuit



(fig. 4)

4. FM/AM selector circuit



(fig. 5)

The FM/AM selector circuit is shown in the diagram. fig. 5. Pins 4 and 5 of Q702 are of the mutual reset type. For FM, pin 4 is high and pin 5 is low; for AM, pin 4 is low and pin 5 is high. Because pin 5 is high and pin 4 is low during AM reception, Q809 is on and Q808 is off, the analogue switches SW1 and SW2 of Q203 are on while SW3 and SW4 are off, so an AM signal is output. Also, since Q706 goes to on and Q705 to off, the AM, kHz segments of the fluorescent display are turned on. Q844 goes to off so the FM indicators is turned off. At the same time, Q155 is turned

During FM reception, this is operated by the IF level detection and zero point detection circuits included in the FM IF system IC of Q103 and by the noise component detection circuit of Q806. When a station is tuned, the output of all outputs go to the low level so Q843 goes from on to off, causing pins 32 and 33 of the controller IC to go to the high level to complete auto search tuning.

During AM reception, the AM IF signal is taken, amplified by Q181, limited to a certain amplitude by the D181 D182 limiter circuits and auto search tuning is completed when the IF signal becomes 450 ± 3 kHz.

• Manual Tuning

When the UP or DOWN key is pressed, the frequency goes up or down by one step. When either key is held down, the frequency rapidly increases or decreases (scans) and stops when the key is released. When either end of the tuning range is reached, key input will no longer be received and the frequency will stop at the highest or lowest frequency.

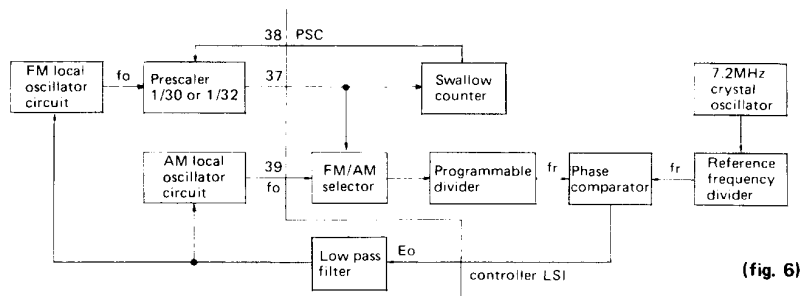
• Auto Tuning

When the UP or DOWN key is pressed, scanning begins in the up or down direction, stopping where there is a radio station. Since auto scan is operated by a triangular wave, scanning is begun in the opposite direction the instant either end of the tuning range is reached. Also, if the UP or DOWN key is pressed when the tuned frequency is not at either end of the range, up or down scanning will begin.

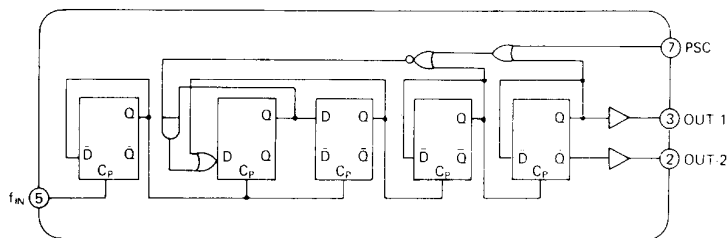
off and Q154 turned on, so +B is supplied to the power source terminal of the radio system pin 3 of Q152.

Pin 16 of Q201 goes to the high level, the VCO oscillator stops, and pin 2 of Q103 goes to the high level so the FM IF amp is also switched off. Also, during AM reception, Q801 is turned on so the muting circuit is off. During FM reception, all of the switching transistors mentioned above perform the opposite operations to switch to the FM mode. Figures in parentheses indicate transistor operation during FM reception.

5. PLL tuned circuit



(fig. 6)



(fig 7) TD6104P (Prescaler)

A block diagram of the tuned circuit of the PLL is shown in figer 6.

Operation during AM reception

The reception frequency is applied to the programmable divider where it is divided to $1/N$ and output as f_v . This is applied to the phase comparator where it is compared with frequency reference f_r (9kHz for G/W model and 10kHz for D model). If f_r and f_v differ, E_o equal to the difference in frequency is output. Since error output E_o is a pulse waveform, it is passed through the low pass filter to change it into DC voltage V_D , which is applied to the variable capacitor diode in the front end to change the reception frequency. This continues until f_v and f_r are the same and $E_o=0$.

Operation during FM reception

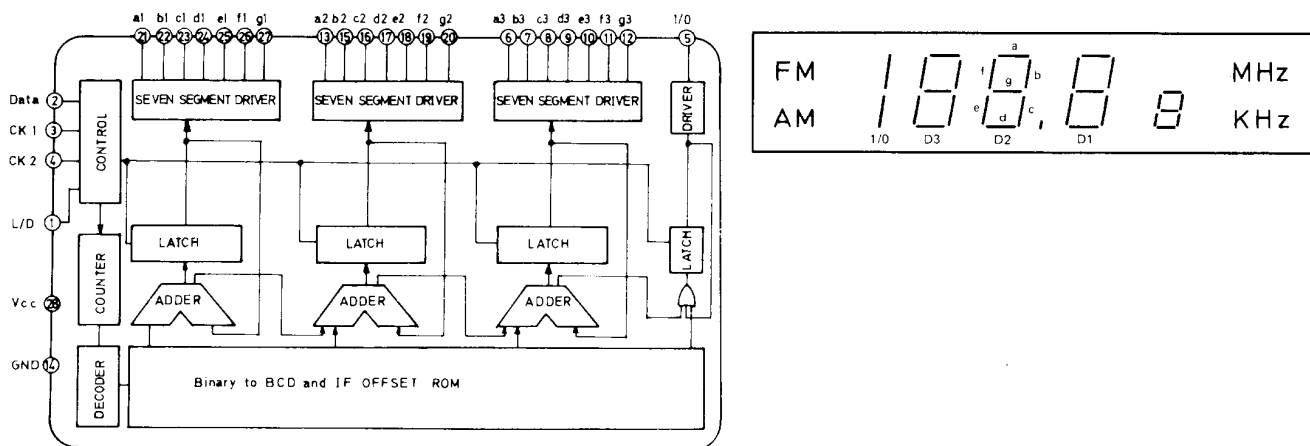
The pulse swallow method is used in the prescaler of this unit. In this type of prescaler, a supplementary number

(changed according to the program code input) and the divided reception frequency from the prescaler are combined in the control counter and the prescaler's division factor is switched 1/30 or 1/32 according to external control (1/32 when the PSC terminal is "H" and 1/30 when it is "L").

The station oscillator frequency is applied to the programmable divider, but the programmable divider has an upper frequency limit of only 30MHz, so the pulse swallow-type prescaler, which can be used up to 150 MHz, is inserted for division to $1/N_p$:

The signal is applied to the programmable divider and divided to $1/N$. The result is compared with a 25kHz frequency reference in the phase detector and the error is output as E_o until a match is obtained as in AM operation.

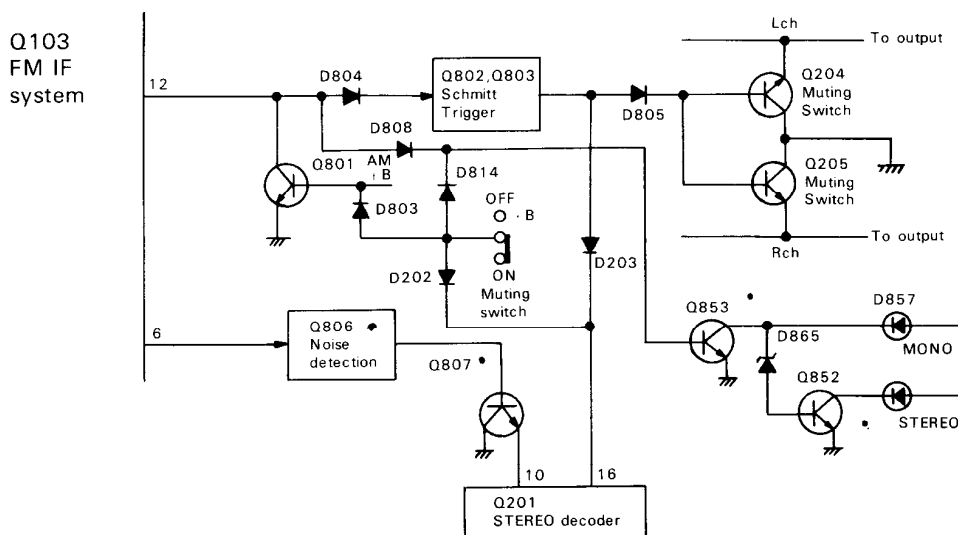
6. Frequency indicator circuit



(fig. 8) TD6301AP block diagram

Pin No.	Terminal	Description
1	L/D	Output indication switching input terminal: Fluorescent display at the low level, and LED display at the high level.
2	Data	Tuned frequency data input terminal: Input from the system controller LSI to the serial.
3,4	CK1, CK2	Tuned frequency data input control timing input terminal: Transferred simultaneously with data from the system controller LSI.
5	I/O	Segment drive output terminal: Sets the number of display digit for FM (100MHz) and AM (1,000kHz) reception.
6-12	a3-g3	Seven segment drive output terminals: Sets the number of display digit for FM(10MHz) and AM (100kHz) reception.
13, 15-20	a2-g2	Seven segment drive output terminals: Sets the number of display digit for FM (1MHz) and AM (10kHz) reception
21-27	a1-g1	Seven segment drive output terminals; set the number of display digit for FM (100kHz) and AM (1kHz) reception
14	V _{CC}	Power source terminal
28	Gnd	Ground

7. Muting circuit



The muting circuit operates in the following cases.

- While pin 28 of the controller IC outputs the high level, Q204 and Q205 are turned on and muting is closed in the following cases: (1) While the manual UP/DOWN switch is being held down, (2) When a station in the memory is recalled, and (3) While a radio station is being received using auto search tuning.
- When an FM station is not being received (and the muting switch is on).

The IF level in the FM IF system (set at R116 so muting is opened at 17 dBf) and zero point detection circuit (tuning point $35 \pm 15\text{kHz}$) are output at pin 12 through

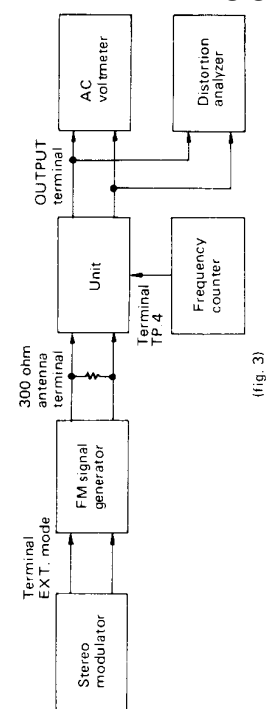
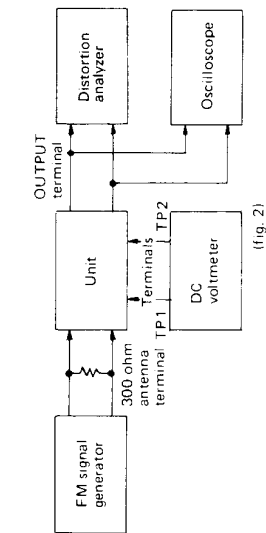
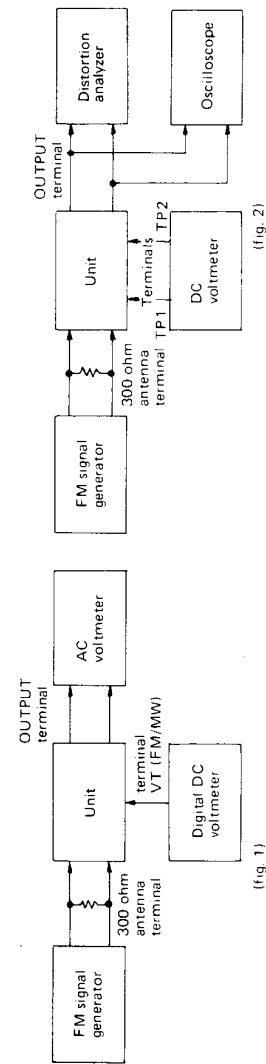
the AND circuit. When a station is tuned, the output goes to the low level.

When output goes to the low level, Q802 is turned off, Q803 is turned on and Q203 and Q204 are turned off, so muting is opened. At the same time, pin 16 of stereo decoder Q201 goes to the low level, so the VCO oscillator starts.

ADJUSTMENT PROCEDURES

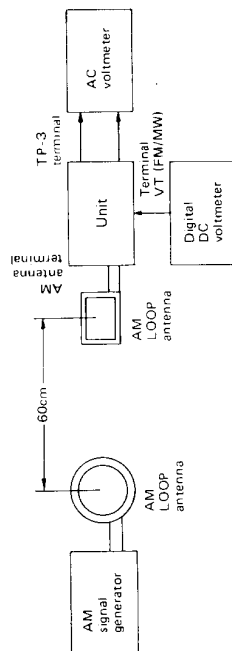
FM section

Item	Step	Connection of instrument	FM SG output	Stereo modulator output	Turning dial setting	Output indicator	Adjustment	Adjust for	Remarks
FM RF	1	Fig. 1	—	—	88.0 MHz	Digital DC voltmeter	T1	1.4V	
	2	Fig. 1	107.9 MHz 1 kHz, 75 kHz devi.	—	107.9 MHz	AC voltmeter	C7, C9 (G)	Maximum output	
FM IF	1	Fig. 2	98.1 MHz 1 kHz, 75 kHz devi. 65 dBf	—	98.1 MHz	DC voltmeter	L101 Primary coil	0V	Repeat the steps 1 and 2 until no further adjustment is necessary
	2	Fig. 2		—	98.1 MHz	Distortion analyzer	L101 Secondary coil	Minimum	
VCO		Fig. 3	98.1 MHz No modulation 65 dBf	—	98.1 MHz	Frequency counter	R214	19 kHz \pm 19 Hz	Remove the frequency counter after adjustment
Separation	1	Fig. 3	98.1 MHz 65 dBf Ext. modulation	L ch. 1 kHz	98.1 MHz	R ch. AC voltmeter	R204	Minimum	Maximum and same separation
	2			R ch. 1 kHz		L ch. AC voltmeter		Minimum	
Distortion		Fig. 3	98.1 MHz 65 dBf Ext. modulation	L+R 1 kHz	98.1 MHz	Distortion analyzer	T2	Minimum	
Muting level	1	Fig. 2	98.1 MHz 17.2 dBf 1 kHz, 75 kHz devi. 98.1 MHz 16.2 dBf 1 kHz, 75 kHz devi.	—	98.1 MHz	Oscilloscope	R116	Signal output	Muting switch to on.
	2							No output	



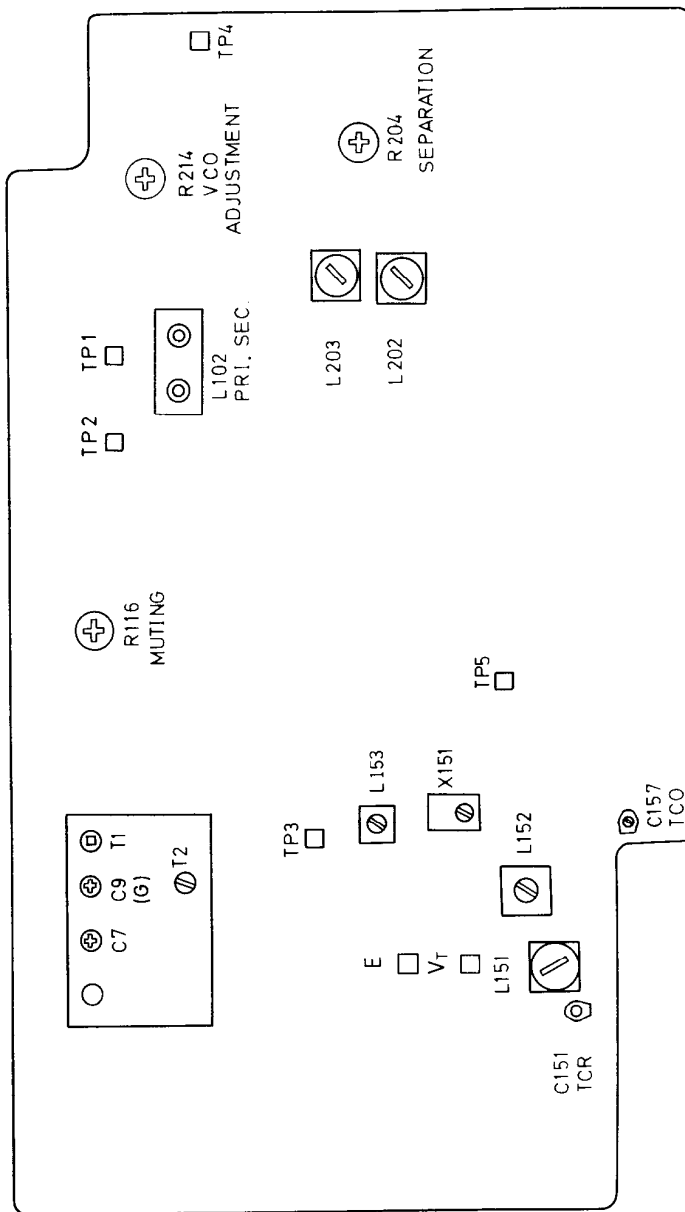
AM section

Step	AM SG output	Tuned frequency	Output indicator	Adjustment point	Adjust for	Remarks
1	999kHz (1000kHz) 400Hz 30% mod.	999kHz (1000kHz)	AC voltmeter	X151 L153	Maximum	
2		522kHz (520kHz)	Digital DC voltmeter	L152	1.2V	Repeat the steps 2 and 3 until no further adjustment is necessary.
3		1611kHz (1710kHz)	Digital DC voltmeter	C157	9.5V (10.5V)	
4	603kHz (600kHz) 400Hz 30% mod.	603kHz (600kHz)	AC voltmeter	L151	Maximum	Repeat the steps 4 and 5 until no further adjustment is necessary.
5	1404kHz (1400kHz) 400Hz 30% mod.	1404kHz (1400kHz)	AC voltmeter	C151	Maximum	



- FM signal strength meter adjustment (Only 120V model)
Set the output of FM SG to 98.1MHz, 1kHz, 75kHz devi and 65dBf. Adjust R123 so that fourth signal indicator lights on.

() : 120V model



PCB PARTS LIST/VIEW FROM COMPONENT SIDE

FM/AM TUNER PCB VIEW

FM/AM TUNER PC BOARD ASS'Y (NARF-2009c/d/e)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Front end	
TU001	240061	FE349U14 (D/W)
	240059	FE416U33 (G)
	ICs	
Q103	222803	μ PC1267C2 (D/ W)
	222608	μ PC1167C (G)
Q152	222804 or	μ PC1168C or
	222629	μ PC1243C
Q201	222678	μ PC1161C3
Q203	222575 or	TC4066BP or
	222840661	4066B
Q952	222780122	78M12
	Transistors	
Q101	2211723	2SC1923(O)
Q102	2211723	2SC1923(O) (G)
Q151,Q202	2211945 or	2SK246(GR) or
	2212304	2SK381(D)
Q807-Q809	2210746	2SC945A (P)
Q141-Q144		

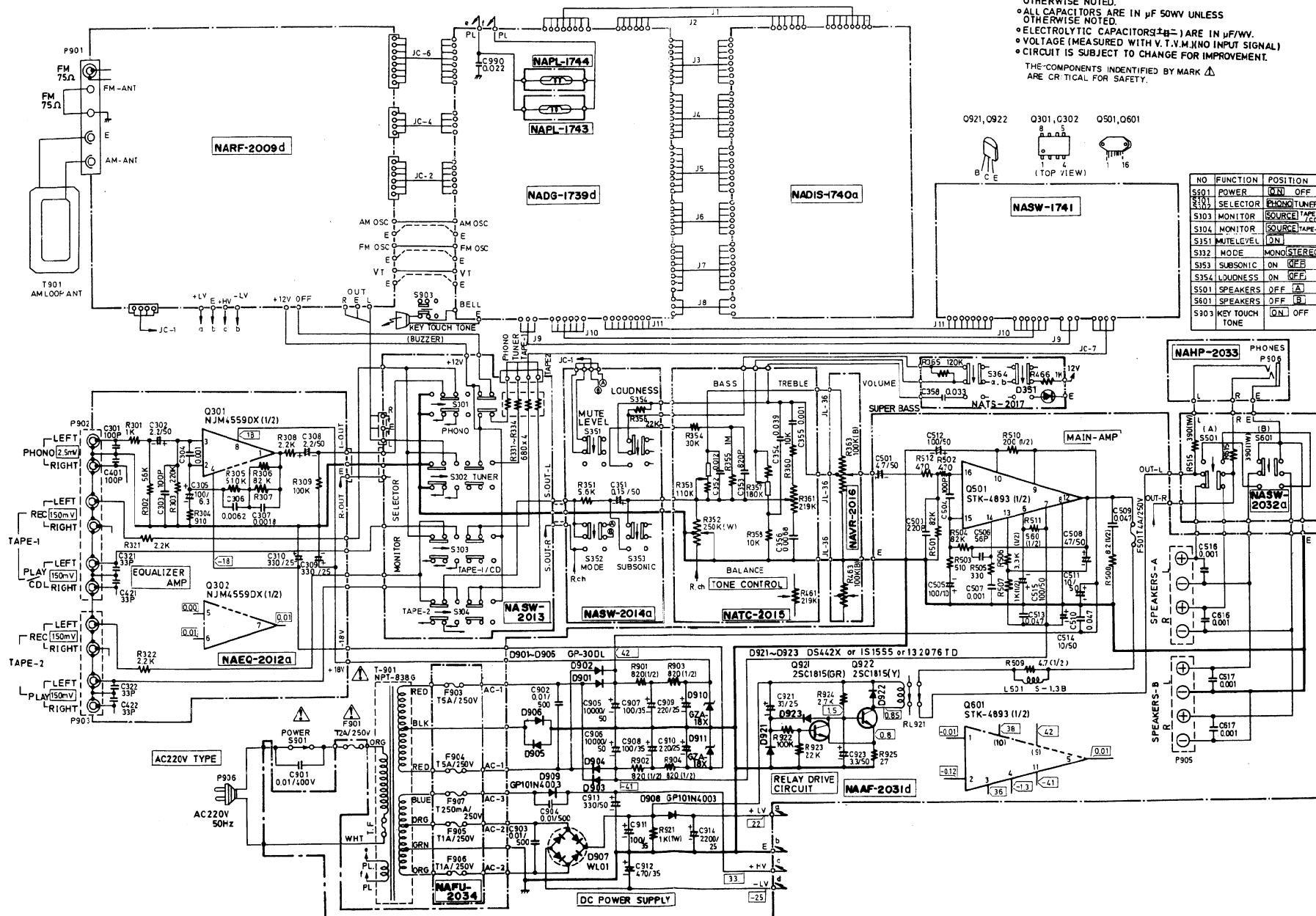
CIRCUIT NO.	PART NO.	DESCRIPTION
	Transistors	
Q153-Q155	2211254,	2SC1815(Y),
Q801-Q804	2211255,	2SC1815(GR),
Q807-Q809	2210746,	2SC945A(P),
Q141-Q144	2212484 or	JC501P or
	2212485	JC501Q
Q204,Q205	2211705	2SD655(E)
Q805, Q806	2211255	2SC1815(GR)
Q951,Q953	2211255	2SC1815(GR)
	Diodes	
D001	2243192,	MTZ8.2B,
	2242866 or	EQA02-08C or
	2239552	RD8.2EB2(G)
D102	223105,	1S1555,
D141,D142	223133,	DS442X,
D201-D203	223145 or	1S2076TD or
D801-D805	223150	US1040
D808-D812		
D814,D817		
D103,D153	4000068	VD1222
D151,D152	223140	KV1236

CIRCUIT NO.	PART NO.	DESCRIPTION
D815,D816	2241291	RD3.3EB1
D951	2239792,	RD27EB2,
	2243012 or	EQA02-25B or
	2242741	GZA27X
D952	2239433,	RD4.7EB3,
	2243133 or	MTZ-4.7C or
	2242835	EQA02-05B
D953	2239433,	RD6.2EB3,
	2243163 or	MTZ6.2C or
	2242848	EQA02-06E
Transformers		
L102	233270	NF1F-6040
L153	232095	NM1F-6025
Coils		
L001	233312	NFA-3051 (G)
L101	233105 or	NCH-1005 or
	233024	NCCH-1501
L151	232113	NMA-3049
L152	232084	NMO-2018
L201	233236	NMC-6027 (G)
L202,L203	233291	NMC-5039
L801	231042	NCH-2082
L802	233031	NMC-9-1
Ceramic filters		
X101,X102	3010071	SFE10.7MA5 (D/W)
X101-X103	3010043	SFE10.7MM (G)
X151	3010075	SFL450B3
Capacitors		
C108, C110	352780109	1 μ F, 50V, Elect.
C111	352784799	0.47 μ F, 50V, Elect.
C117	352741009	10 μ F, 16V, Elect.
C142	352780339	3.3 μ F, 50V, Elect.
C151, C157	3060010	NTC20P09, Trimmer
C155	370135114	510pF \pm 5%, 100V, APS
C163	352741019	100 μ F, 16V, Elect.
C167	352741009	10 μ F, 16V, Elect.
C168	352750479	4.7 μ F, 25V, Elect.
C169	352741009	10 μ F, 16V, Elect.
C174	352784799	0.47 μ F, 50V, Elect.
C202	352750479	4.7 μ F, 25V, Elect.
C208	352744719	470 μ F, 16V, Elect.
C209, C210	352741009	10 μ F, 16V, Elect.
C213	370134714	470pF \pm 5%, 100V, APS
C214	352780109	1 μ F, 50V, Elect.
C215	352780339	3.3 μ F, 50V, Elect.
C216	352782299	0.22 μ F, 50V, Elect.
C218, C219	352780109	1 μ F, 50V, Elect.
C220	352724719	470 μ F, 6.3V, Elect.
C801	352780109	1 μ F, 50V, Elect.
C802	352780229	2.2 μ F, 50V, Elect.
C806	352783399	0.33 μ F, 50V, Elect.
C809	352780229	2.2 μ F, 50V, Elect.
C951	352780109	1 μ F, 50V, Elect.
C954	352751019	100 μ F, 25V, Elect.
C956	352724719	470 μ F, 6.3V, Elect.
C958	352780109	1 μ F, 50V, Elect.
C970	352751029	1,000 μ F, 25V, Elect.
Resistors		
R116	5215003	N08HR20KBC, Semi-fixed
R123	5215038	N08HR500K BA, Semi-fixed (D/W)
R204	5215048	N08HR200KBC, Semi-fixed
R214	5215044	N08HR5KBC, Semi-fixed
R952	441721204	12ohm, 2W, Metal oxide film
R955	441523904	39ohm, 1/2W, Metal oxide film
Terminal		
P901	25060082	NTM-4PDMN26, Antenna (D/W)
	25060083	NTM-5PDMN27, Antenna (G)
Switch		

Note: (D): Only 120V model
 (G): Only 220V model
 (W): Only 120/220V model

SCHEMATIC DIAGRAM

-G/Q MODELS-



ONKYO CORPORATION

SCHEMATIC DIAGRAM

- D/W MODELS -

NOTES

- ALL RESISTORS ARE IN OHMS 1/4WATT UNLESS OTHERWISE NOTED.
- ALL CAPACITORS ARE IN μ F 50VW UNLESS OTHERWISE NOTED.
- ELECTROLYTIC CAPACITORS ARE IN μ F/WV.
- VOLTAGE (MEASURED WITH V.T.V.M. NO INPUT SIGNAL)
- CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.

THE COMPONENTS IDENTIFIED BY MARK Δ ARE CRITICAL FOR SAFETY.

NO	FUNCTION	POSITION
S801	POWER	(ON) OFF
S101	SELECTOR	PHONO/TUNER
S303	MONITOR	SOURCE TAPE-2
S304	MONITOR	SOURCE TAPE-2
S351	MUTE LEVEL	(ON) OFF
S332	MODE	MONO/STEREO
S353	SUBSONIC	ON OFF
S354	LOUDNESS	ON OFF
S501	SPEAKERS	OFF (A)
S501	SPEAKERS	OFF (B)
S903	KEY TOUCH TONE	(ON) OFF

ONKYO CORPORATION

PCB PARTS LIST/VIEW FROM COMPONENT SIDE

DIGITAL CIRCUIT PCB VIEW

1

2

TUNER SWITCH PC BOARD ASS'Y (NASW-1741)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
LEDs		
D759	225126	GL3PR1
D865, D866	225137	SEL2413E
D867, D868	225142	SEL2913K
Switches		
S751-S765	25035275	NPS-111-S239
Spacer		
	27270103	
Holders		
	27190224	LED

DE-EMPHASIS SWITCH PC BOARD ASS'Y (NASW-1737) (Only W model)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
S201	250142	NSS-2225, De-emphasis switch

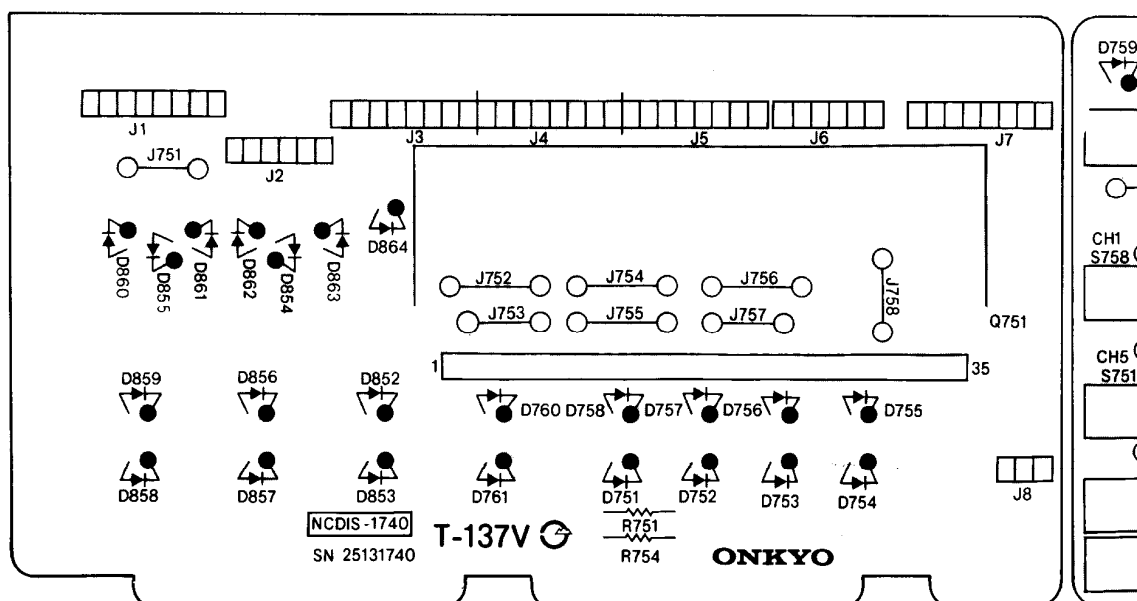
BAND SELECTOR SWITCH PC BOARD ASS'Y (NASW-1742) (Only W model)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
S701	250142	NSS-2225, Switch

DIAL PLATE ILLUMINATION LAMP PC BOARD ASS'Y (NAPL-1743/1744)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
PL901	210162	PL6. 3V0. 25 A, Lamp

FLUORESCENT INDICATOR TUBE PCB VIEW

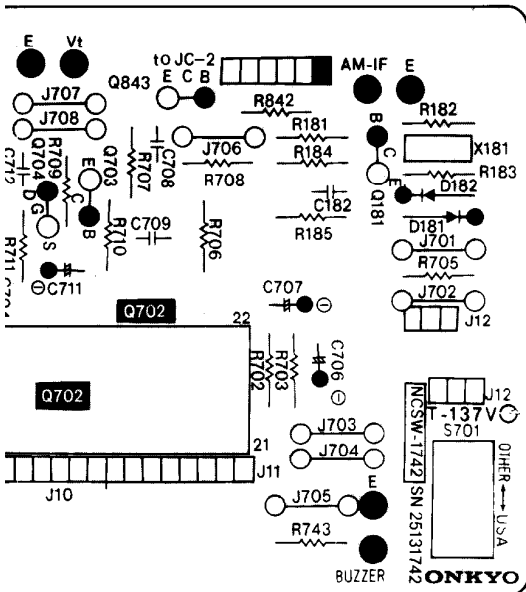


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4

5

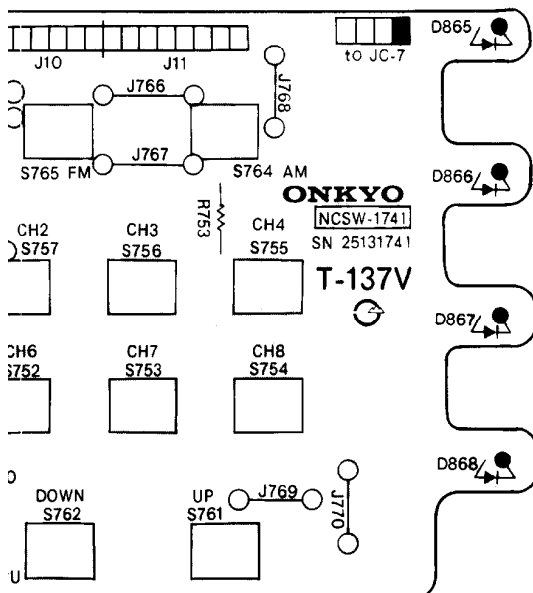
Notes: (D): Only 120V model
 (G): Only 220V model
 (W): Only 120/220V model
 (Q): Only 240V model



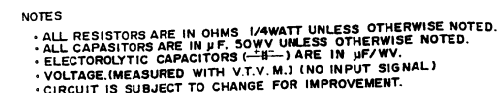
BUZZER PC BOARD PARTS LIST

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	241048	PKM24-4A0, Buzzer

SWITCH PCB VIEW

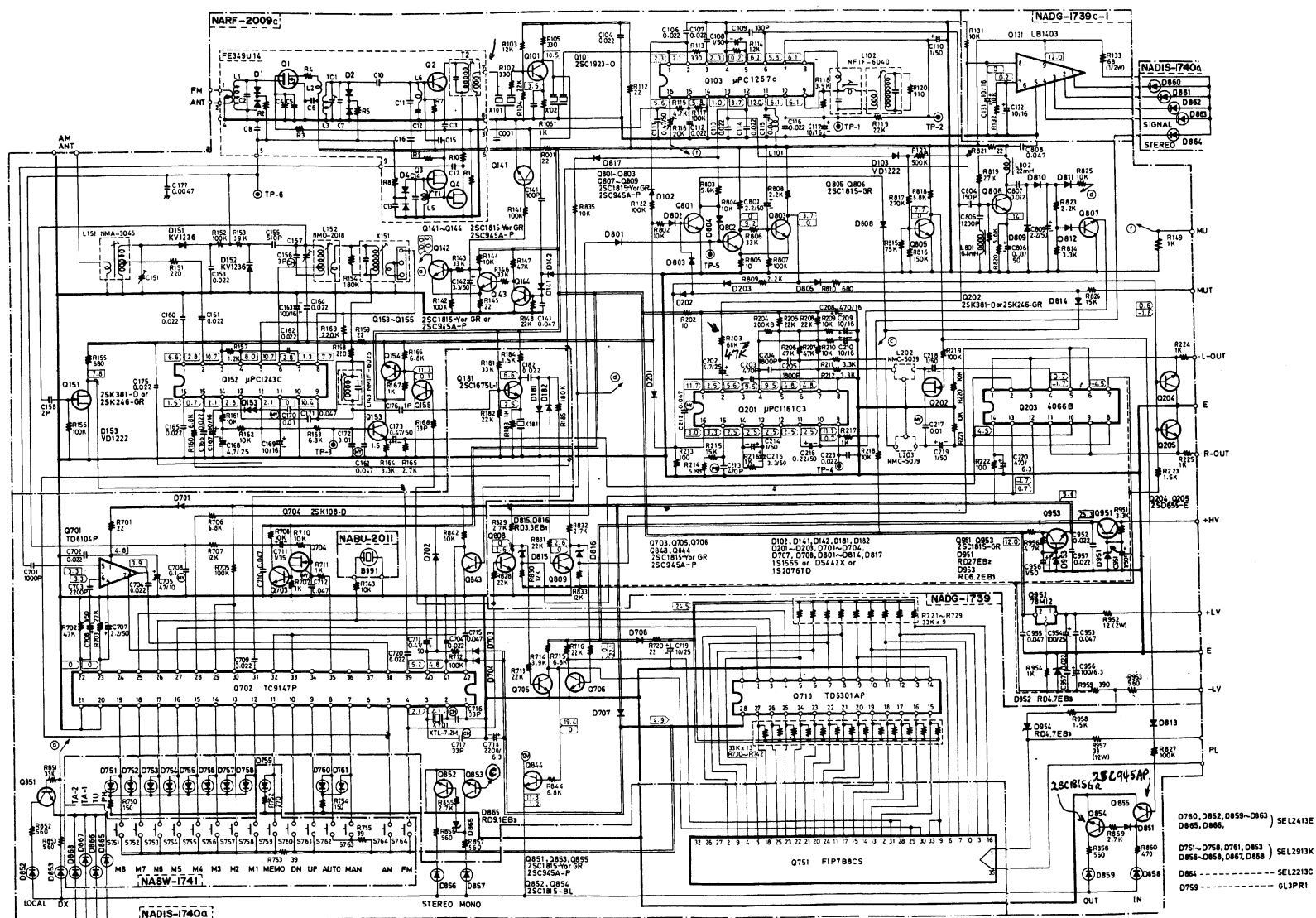


– G/Q MODELS –



SCHEMATIC DIAGRAM

— 120V MODEL —

25K108
25K38125C1815
25A1015
25C1815
25C1923

78M12



LB1103



TD6104P



4066B



TD6301AP

μPC1187C2
μPC1181C3
μPC224C

TC9147P



FIPT78BCS



34.36



34.36



34.36



34.36



34.36



34.36



34.36



34.36



34.36



34.36



34.36



34.36



34.36



34.36



34.36



34.36

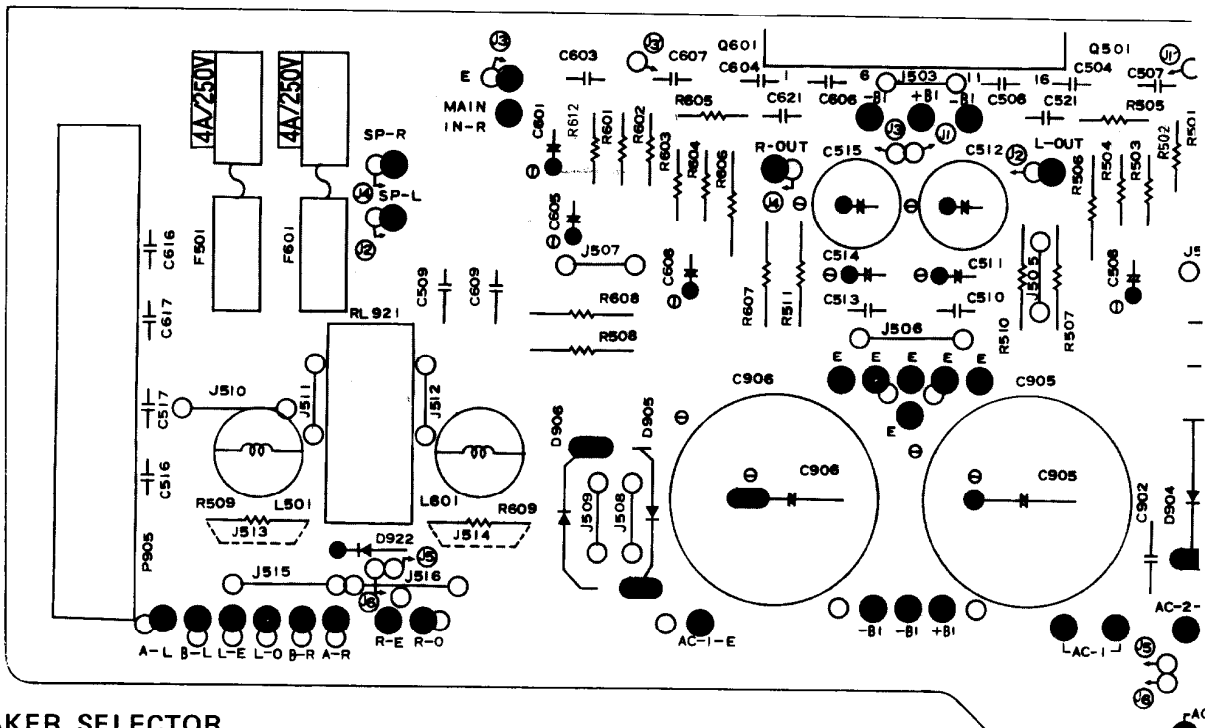


34.36

NOTES
 • ALL RESISTORS ARE IN OHMS 1/4WATT UNLESS OTHERWISE NOTED.
 • ALL CAPACITORS ARE IN μF 50V UNLESS OTHERWISE NOTED.
 • ELECTROLYTIC CAPACITORS (—E—) ARE IN μF/WV.
 • VOLTAGE (MEASURED WITH V.T.V.M.) (NO INPUT SIGNAL).
 • CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.

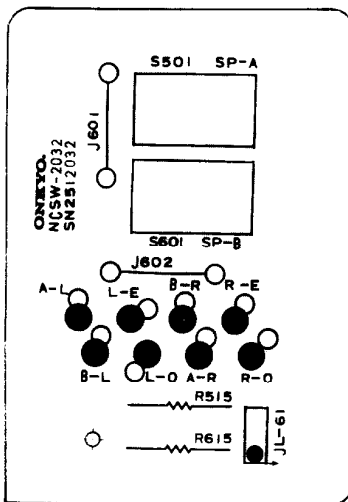
PCB PARTS LIST/VIEW FROM COMPONENT SIDE

POWER SUPPLY AND AMPLIFIER PCB VIEW

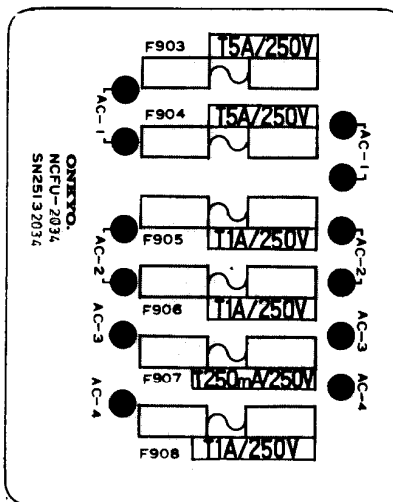


SPEAKER SELECTOR

SWITCH PCB VIEW



FUSE PCB VIEW



**SPEAKER SELECTOR SWITCH PC BOARD ASS'Y
(NASW-2032a)**

CIRCUIT NO.	PART NO.	DESCRIPTION
	Resistors	
R515, R615	441523914	390ohm, 1/2W, Metal oxide film
	Switches	
S501, S601	25035397	NPS-222-L361

HEADPHONE TERMINAL PC BOARD ASS'Y (NAHP-2033)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
P906	25045138	HLJ0520-01-010

FUSE TERMINAL PC BOARD ASS'Y (NAFU-2034)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Fuseholders	
	25050065	YSH403T
	Fuses	
⚠ F903, F904	252078	5A-SE-EAK
⚠ F905, F906	252070	1A-SE-EAK
⚠ F907	252088	250mA-SE-EAWK (Only 220/240V models)

Note: (D): Only 120V model
 (G): Only 220V model
 (W): Only 120/220V model
 (Q): Only 240V model

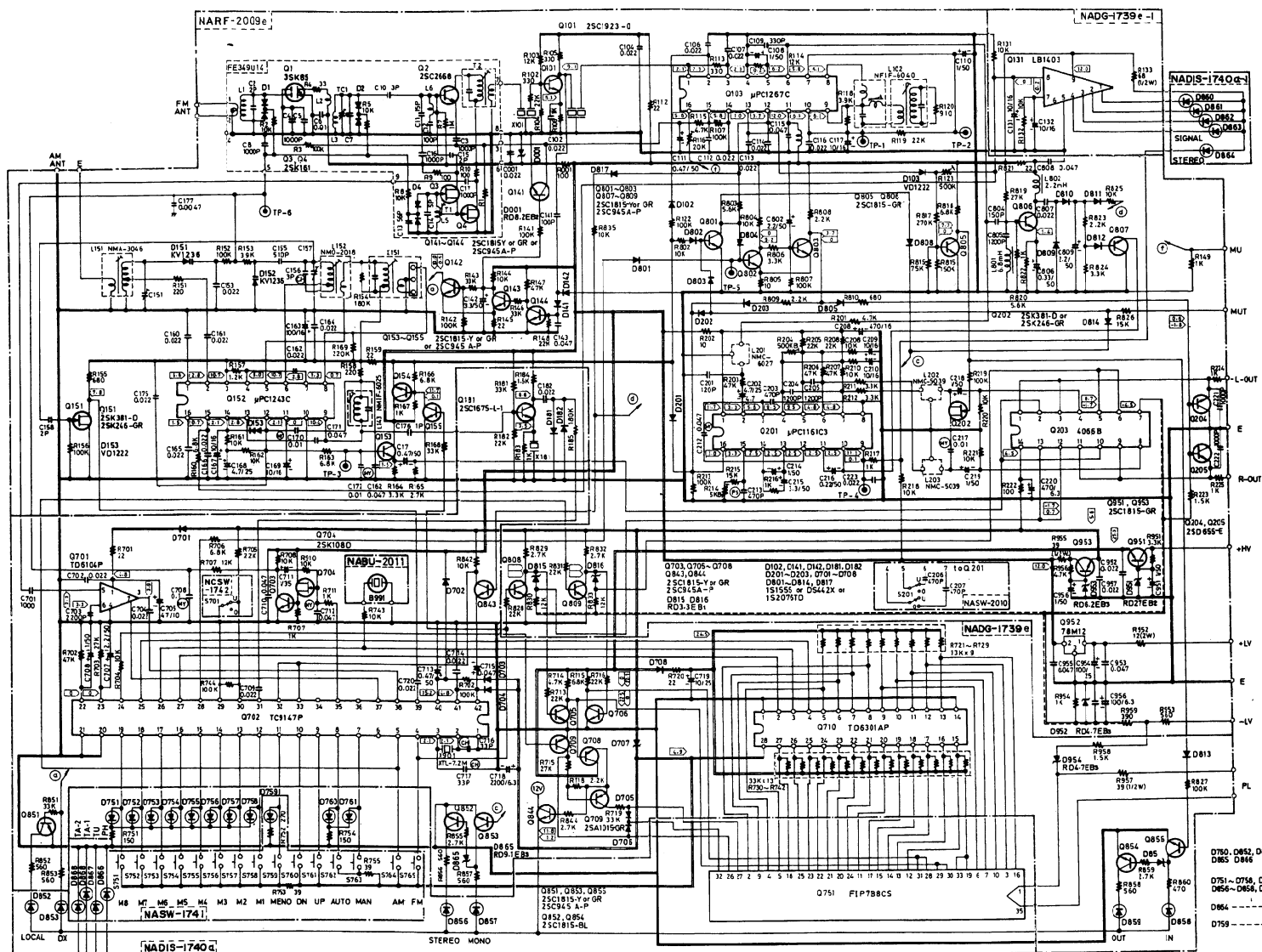
POWER SUPPLY AND POWER AMPLIFIER CIRCUIT PC BOARD ASS'Y (NAAF-2031c/d/e)

CIRCUIT NO.	PART NO.	DESCRIPTION
	IC	
Q501, Q601	222036	STK-4893, Power amplifier
	Transistors	
Q921	2211255	2SC1815 (GR)
Q922	2211254	2SC1815 (Y)
	Diodes	
D901-D906	223863	GP30DL
D907	223862	WL-01
D908, D909	223880	GP101N4003
D910, D911	2241191,	GZA-18X
	2241192 or	GZA-18Y or
	2243273	MTZ-18C
D921-D923	223145,	1S2076TD,
	223133	DS442X
	223105 or	1S1555 or
	223150	US1040
	Coils	
L501, L601	231001	S1.3B (G/Q)
	Capacitors	
C501, C601	352780479	4.7 μ F, 50V, Elect.
C505, C605	352731019	100 μ F, 10V, Elect.
C508, C608	352784709	47 μ F, 50 V, Elect.
C511, C514	352781009	10 μ F, 50V, Elect.
C512, C515	352781019	100 μ F, 50V, Elect.
C905, C906	3504178	10.000 μ F, 50V, Elect.
C907, C908	352761019	100 μ F, 35 V, Elect.
C909, C910	352752219	220 μ F, 25V, Elect.
C911	352761019	100 μ F, 35V, Elect.
C912	352764719	470 μ F, 35V, Elect.
C913	352783319	330 μ F, 50V, Elect.
C914	352752229	2.200 μ F, 25V, Elect.
C921	352753309	33 μ F, 25V, Elect.
C923	352780339	3.3 μ F, 50V, Elect.
	Resistors	
R506, R606	441523324	3.3kohm, 1/2W, Metal oxide film
R507, R607	441521024	1kohm, 1/2W, Metal oxide film
R508, R608	441520824	8.2ohm, 1/2W, Metal oxide film
R509, R609	441520474	4.7ohm, 1/2W, Metal oxide film (G/Q)
R510	441522014	200ohm, 1/2W, Metal oxide film
R511	441525614	560ohm, 1/2W, Metal oxide film
R901-R904	441528214	820ohm, 1/2W, Metal oxide film
R905	431523355	3.3Mohm, 1/2W, Solid (D)
R921	441621024	1kohm, 1W, Metal oxide film
	Relay	
RL921	25065134	NRL-2P5A-DC24-07
	Terminal	
P905	25060058	NTM-8PDML25, Speaker
	Fuseholders	
△ F901a, F501a	250113	SN5051 (D/W)
F601a		
F902a	25050065	YSH403T (G/Q/W)
F501a, F601a	25050065	YSH403T (G/Q)
	Fuses	
△ F501, F601	252059	4A (SS-2), Speaker (D/W)
	252077	4A-SE-EAK, Speaker (G/Q)
△ F901	252049	4A (S1-6), Primary (D/W)
△ F902	252074	2A-SE-EAK, Primary (G/Q/W)

NOTE: THE COMPONENTS IDENTIFIED BY MARK
 △ ARE CRITICAL FOR RISK OF FIRE AND
 ELECTRIC SHOCK. REPLACE ONLY WITH
 PARTS NUMBER SPECIFIED.

SCHEMATIC DIAGRAM

-120/220V MODEL-



25K108
25K318

25C1815
25A1015
25C245
25C1875
25C1923

78M12

LB1403

TD6104P

40668

TD6301AP

µPC1197C2
µPC1181C3
µPC1243C

TC9147P

FM 18.8 MHz
AM 18.8 KHz
F1P788C5

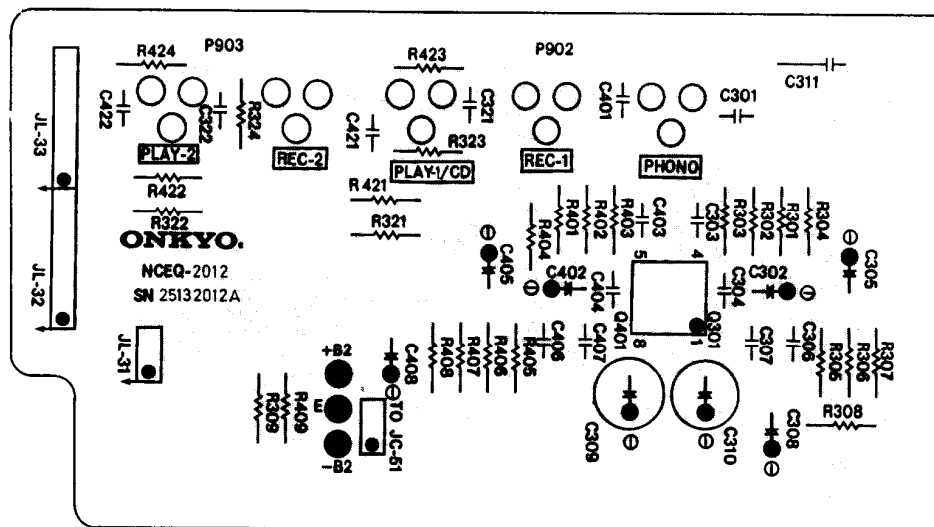
Segment
a
b
c
d

NOTES

- ALL RESISTORS ARE IN OHMS 1/4WATT UNLESS OTHERWISE NOTED.
- ALL CAPACITORS ARE IN µF. 50VW UNLESS OTHERWISE NOTED.
- ELECTROLYTIC CAPACITORS (—E—) ARE IN µF/VV.
- VOLTAGE (MEASURED WITH V.T.V.M.) (NO INPUT SIGNAL)
- CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.

PCB PARTS LIST/VIEW FROM COMPONENT SIDE

EQUALIZER AMPLIFIER PCB VIEW

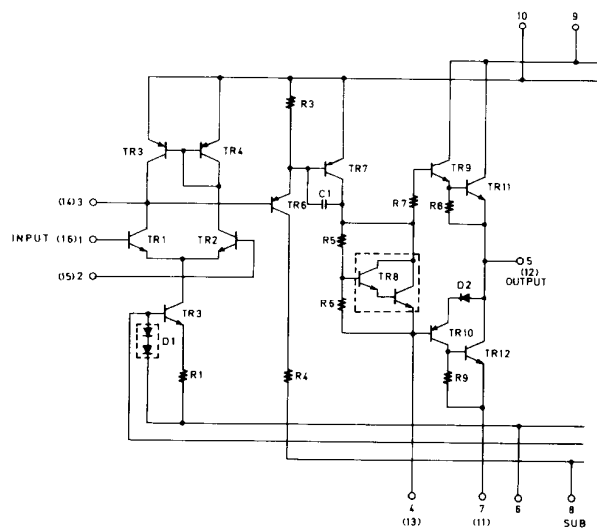


EQUALIZER AMPLIFIER PC BOARD ASS'Y (NAEQ-2012/a)

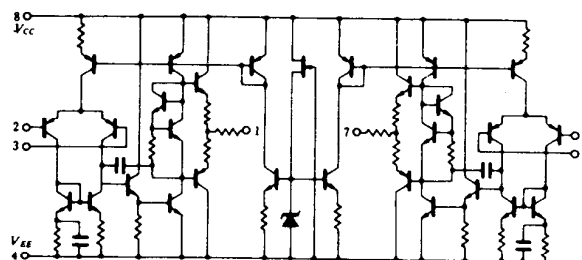
CIRCUIT NO.	PART NO.	DESCRIPTION
IC		
Q301, Q401	222534	NJM-4559DX
	222502 or	NJM-4558DX or
	222570	NJM-4560DX
Capacitors		
C302, C402	352780229	2.2 μ F, 50V, Elect.
C305, C405	352721019	100 μ F, 6.3V, Elect.
C308, C408	352780229	2.2 μ F, 50V, Elect.
C309, C310	352752219	220 μ F, 25V, Elect.
Terminals		
P902	25045137	NPJ-6PDBL52, Phono/Tape 1
P903	25045084	NPJ-4PDBL42, Tape 2

BLOCK DIAGRAM

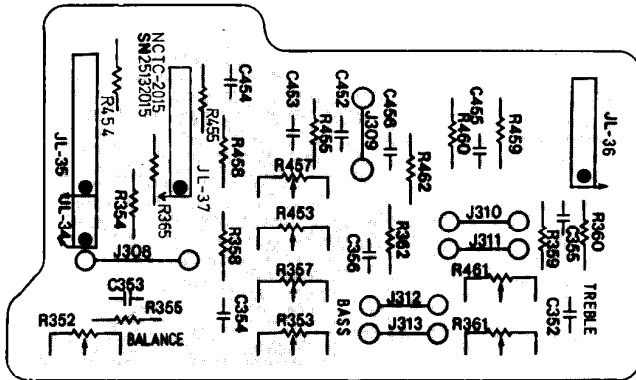
STK-4893 (Power amplifier)



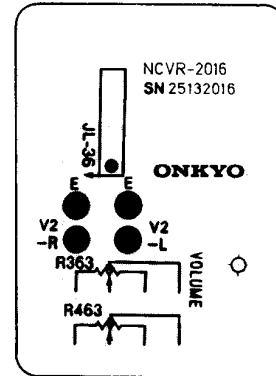
NJM-4559DX (Equalizer amplifier)



TONE CONTROL PCB VIEW



VOLUME CONTROL PCB VIEW



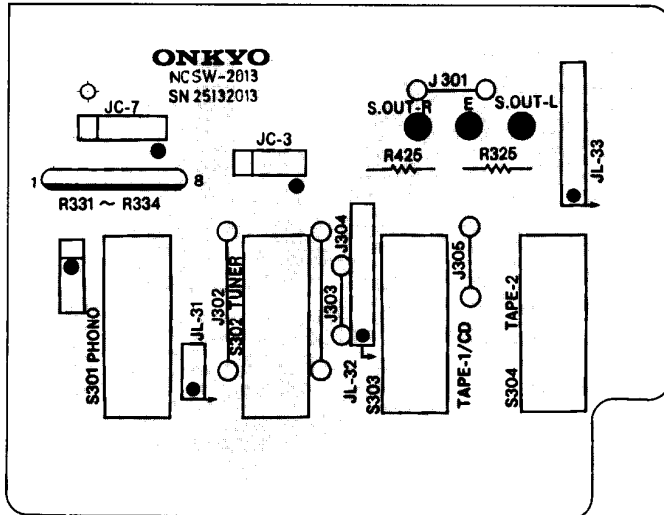
TONE CONTROL CIRCUIT PC BOARD ASS'Y (NATC-2015)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Variable resistors	
R352	5146034	N16RLC250KWT30, Balance
R353, R453	5148073	N16RQMC110K180K30, Bass
R357, R457		
R361, R461	5148074	N16RGM219K30, Treble

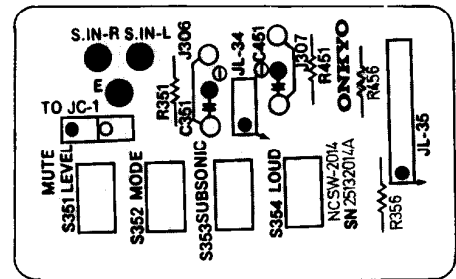
VOLUME CONTROL PC BOARD ASS'Y (NAVR-2016)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
R363, R463	5148093	N16RGM100KBT35, Variable resistor

SELECTOR SWITCH PCB VIEW



SWITCH PCB VIEW



SWITCH PC BOARD ASS'Y (NASW-2014a)

CIRCUIT NO.	PART NO.	DESCRIPTION
S351-S354	25035400	NPS-422-L360, Push switch
C351,C451	352781599	0.15 μ F, 50V, Elect. capacitor

SELECTOR SWITCH PC BOARD ASS'Y (NASW-2013)

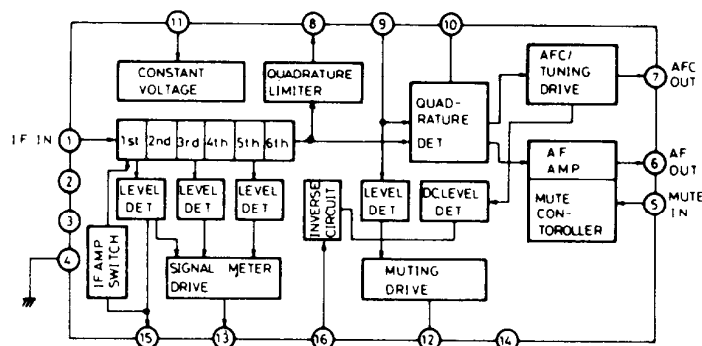
CIRCUIT NO.	PART NO.	DESCRIPTION
	Resistor	
R331-R334	49241681504	680ohmx4, 1/4W. Network
	Switches	
S301-S304	25035395	NPS-442-L358, Push

SUPER BASE PC BOARD ASS'Y (NATS-2017)

CIRCUIT NO.	PART NO.	DESCRIPTION
D351	225141	SEL2213C, LED
S364	25035422	NPS-142-L386, Push SWITCH
	27190273	Holder, LED

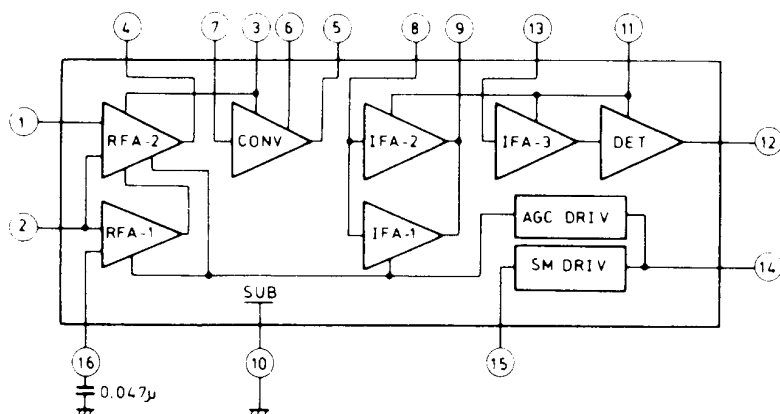
BLOCK DIAGRAM OF IC

μ PC1267C/ μ PC1167C2 (FM IF system)

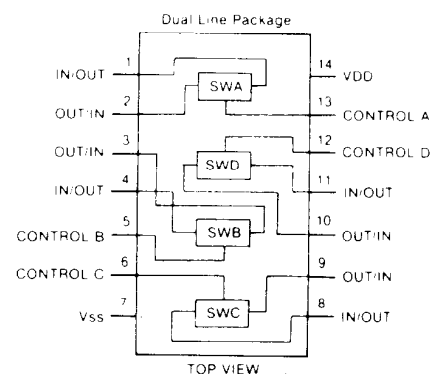


1. IF signal input
2. IF amplifier switch inp
H level: Off
5. Muting switch input
6. Composite signal output
7. AFC output
8. IF amplifier output
9. 10.7MHz input
10. Reference voltage
11. Power supply
12. Muting output
Tuned: L level
13. Signal strength output
15. AGC output
16. Muting level

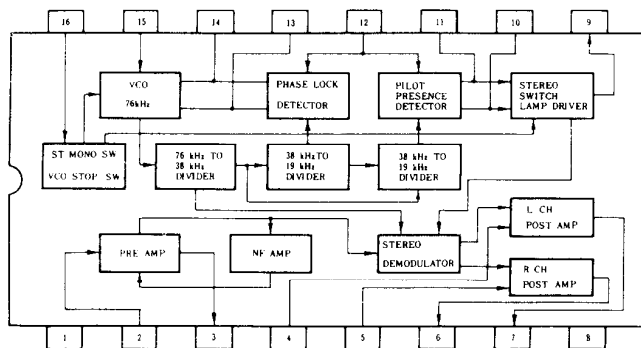
μ PC1168C/ μ PC1243C (AM radio system)



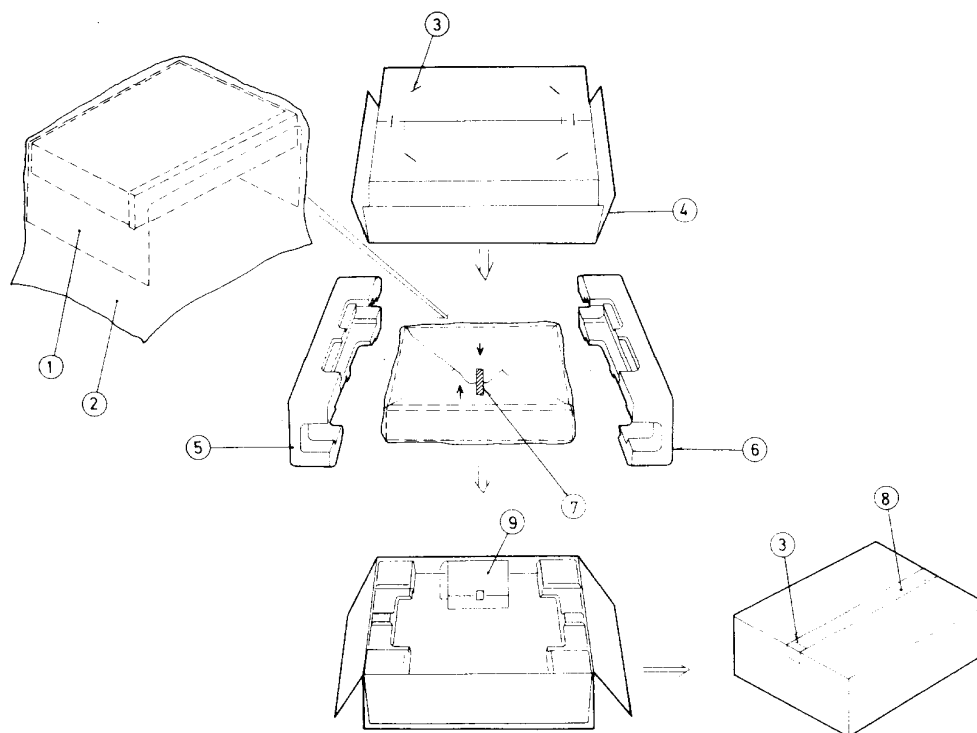
TC4066BP (Analogue switch)



μ PC1161C3 (Stereo decoder)



PACKING VIEW



REF. NO.	PART NO.	DESCRIPTION
1	29095012-1	500×800mm, Protection sheet
2	29100034	650×850mm, Poly-vinyl bag
3	282301	Sealing hook
4	29050971	Master carton box
	29050972	Master carton box (B)
5	29090817A	Pad R
6	29090816B	Pad L
7	29110032	W=15mm, Adhesive tape
8	260012	50(W)×600mm, Damp tape
9		Accessory bag complete

U.S.A. model

292064A	FM antenna
29100006	350×250mm, Poly-vinyl bag
29340770	Instruction manual
29365006-5	Warranty card
29358002A	Service station list

120V model

292064A	FM antenna
29100006	350×250mm, Poly-vinyl bag
29340770	Instruction manual

220V model

292064A	FM antenna
29100006	350×250mm, Poly-vinyl bag
29340771	Instruction manual

120/220V model

292064A	FM antenna
29100006	350×250mm, Poly-vinyl bag
29340771	Instruction manual
25055040	CV-K-2, Conversion plug

Note: (B): Only black model

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